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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/NOVEMBER 1987

Surprise....
They're Not Frozen

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PACKAGING

Del Monte pumps new life into 'canned' vegetables

In an effort to bring "canned" products into the microwave generation, Del Monte is turning to retortable plastic trays. No refrigeration is needed for vegetables in this new package. The products are shelf-stable just like canned vegetables. Consumers microwave and serve the vegetables in the trays.

The new product is being tested in two markets, Phoenix and Seattle. According to Del Monte, consumer response is much greater than anticipated. Vegetables in the retortable plastic trays have a firm texture and a fresh taste, comparable to frozen vegetables. They are priced at the low end of the frozen vegetable scale, and a little higher than premium canned vegetables.

Supermarkets are excited about this concept, too. It gives them a value-added product that doesn't require space in the frozen food section, which has been flooded with new items in recent years. In addition to the problem of not having enough space, the expense of operating frozen food cabinets is enormous.

All of this bodes well for retortable plastic packaging. Some big names and some big money are behind this concept. That commitment has resulted in significant R&D expenditures over the past few years, and the fruits of those efforts are now starting to appear commercially.

In addition to Del Monte, several other companies are moving forward commercially with products in retortable plastic containers. And dozens of others have active R&D programs, many of which are said to be approaching full-scale test marketing.

After a long wait, it appears that retortable plastic packaging is finally poised for significant growth in the food industry.

EDITOR

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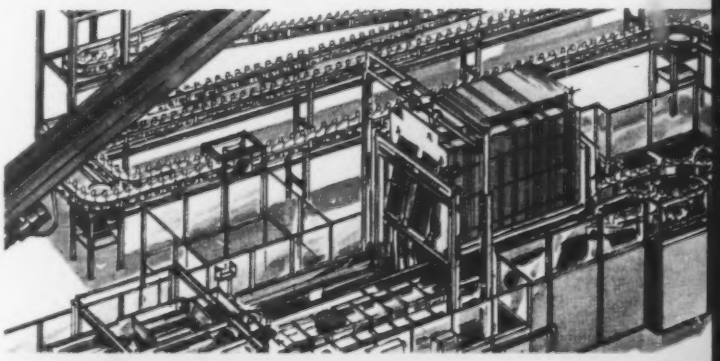
Del Monte's new package
Retortable plastic trays are chosen for vegetables.
Page **10**



Valvoline's new lines
Twelve new packaging lines are installed for motor oil.
Page **54**

1987 Salary Survey
Packaging "decision-makers" respond to questions about compensation and other issues.
Page **46**

WestPack Report
Here's a look at some of the new developments exhibited.
Page **74**

CONTENTS

THE STAFF

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A CAHNERS PUBLICATION VOLUME 32 NUMBER 13

PACKAGING NEWS

Surprise! They're not frozen 10
Del Monte unveils shelf-stable vegetables packed in plastic retortable trays

PET beer bottles are a continuing success for Canadian brewery 16

Squeeze-Fresh bottle is Minute Maid's newest weapon in O.J. war 17

Promotional booklet ends Lea & Perrins' hanger hang-up 18

PACKAGING FEATURES

SPECIAL REPORT

PACKAGING's 1988 Salary Survey 46
Salaries increased to an average $44,000 while average age of respondents fell to 42 years

New developments sparkle at WestPack '87 74
Innovative containers were the highlight of the show, but new equipment also had some ideas to show

PACKAGING OPERATIONS

Plant of the Month: Valvoline's 12 new lines 54
Planning and teamwork pay off as twin lines quickly meet efficiency goals

STATE OF THE ART

New palletizing systems boost efficiency 64
Big changes in machinery and materials are raising speed and cutting costs

MARKETING

New graphics capture milk market 71
The psychological approach to designing graphics pays off for Joyvalle's UHT milk

PACKAGING TECHNOLOGY

Controversy over CFCs 80
Alternatives are available to chlorofluorocarbons blamed, in part, for depletion of the ozone layer

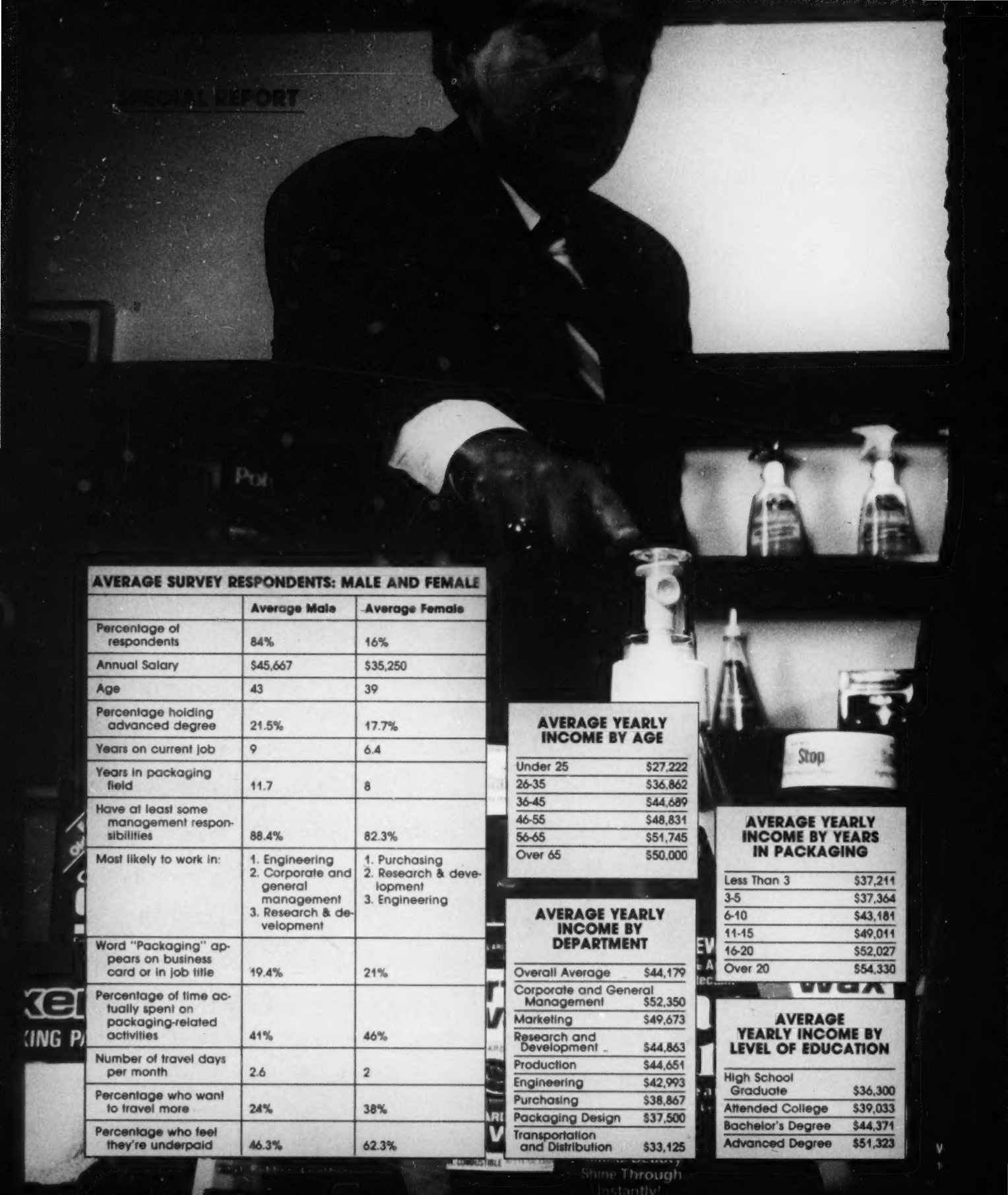
Five-fold increase in labeling achieved with air-jet unit 90

Five stretch-wrappers turn out one million packages a week 91

EDITORIAL	5	**STATISTICS**	41	**CLASSIFIED ADS**	101
PEOPLE	20	**NEW EQUIPMENT**	82	**ADVERTISERS INDEX**	107
CALENDAR	30	**NEW MATERIALS**	92	**WRAP UP**	108
ASSOCIATION NEWS	34	**PACK MART**	100	**READER SERVICE CARD**	109

PACKAGERS IN THIS ISSUE

Coca-Cola Foods	17	Impact Products	18	Old Bushmill Distillery	16
Colgate-Palmolive	31	Joyvalle	68	Pine Mountain Corp.	16
Conners Brewing Co.	17	Land O' Lakes, Inc.	28	Princess Borghese	29
Del Monte	10	Lassonde et Fils	18	Publix Supermarkets	91
General Nutrition Corp.	17	Lea & Perrins	18	Schlage Lock Co.	16
G&J Greenall Ltd.	18	J. Lohr Winery	18	Universal Grinding	90
I&D, Inc.	31	McDonald's Corp.	80	Valvoline Oil Co.	54



AVERAGE SURVEY RESPONDENTS: MALE AND FEMALE

	Average Male	Average Female
Percentage of respondents	84%	16%
Annual Salary	$45,667	$35,250
Age	43	39
Percentage holding advanced degree	21.5%	17.7%
Years on current job	9	6.4
Years in packaging field	11.7	8
Have at least some management responsibilities	88.4%	82.3%
Most likely to work in:	1. Engineering 2. Corporate and general management 3. Research & development	1. Purchasing 2. Research & development 3. Engineering
Word "Packaging" appears on business card or in job title	19.4%	21%
Percentage of time actually spent on packaging-related activities	41%	46%
Number of travel days per month	2.6	2
Percentage who want to travel more	24%	38%
Percentage who feel they're underpaid	46.3%	62.3%

AVERAGE YEARLY INCOME BY AGE

Under 25	$27,222
26-35	$36,862
36-45	$44,689
46-55	$48,831
56-65	$51,745
Over 65	$50,000

AVERAGE YEARLY INCOME BY DEPARTMENT

Overall Average	$44,179
Corporate and General Management	$52,350
Marketing	$49,673
Research and Development	$44,863
Production	$44,651
Engineering	$42,993
Purchasing	$38,867
Packaging Design	$37,500
Transportation and Distribution	$33,125

AVERAGE YEARLY INCOME BY YEARS IN PACKAGING

Less Than 3	$37,211
3-5	$37,364
6-10	$43,181
11-15	$49,011
16-20	$52,027
Over 20	$54,330

AVERAGE YEARLY INCOME BY LEVEL OF EDUCATION

High School Graduate	$36,300
Attended College	$39,033
Bachelor's Degree	$44,371
Advanced Degree	$51,323

PACKAGING'S 1987 SALARY SURVEY

Salaries increased to an average of $44,179. The average age of packaging "decision-makers" decreased to 42 years

By Melissa Larson Senior Editor

The latest in a series of PACKAGING readership surveys reveals that, on the average, respondents are younger—and better compensated—than was true only a few years ago.

Over 400 readers who answered an extensive questionnaire reported an average yearly salary of $44,179, up sharply over $41,200 in the 1986 survey. At the same time, respondents' average age has dropped from 44 years to 42.

Data correlating the yearly salaries of PACKAGING readership with age, gender, level of education, geographic region and number of years in the packaging field is presented here in graphic form. For the first time, female readers responded in numbers significant enough that PACKAGING was able to draw some parallels between men and women in packaging.

Our readers' opinion on the number of packaging-related trade shows and conferences? "Keep them coming!"

Readers also shared their opinions on a number of today's important packaging issues. For instance, a majority of respondents (66%) feel that "problems concerning the recyclability of plastics will adversely affect the competitive future of the plastic container." A similar majority disagree with the statement, "Federal agencies and industry groups have not cooperated enough to try to keep American consumers safe from tampering."

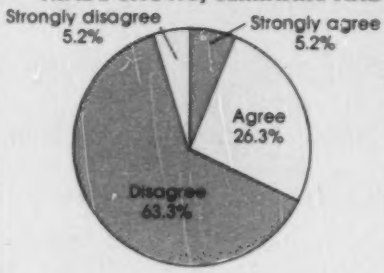
And, by a slim majority (53% to 47%), the survey group disagreed with the oft-repeated belief that "most important new packaging technology originates in Europe rather than the U.S."

PACKAGING's latest survey generated more data than can possibly be included in these pages. We'll periodically be passing along more findings in coming issues. ■

AVERAGE YEARLY INCOME BY REGION

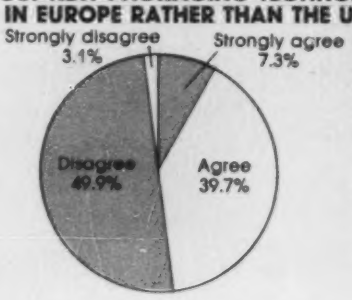
Geographical areas of the country, as determined by the Census Bureau, have an impact on annual salaries. The Western region leads in salary with an average of $46,363, followed by the Northeast, North Central and Southern regions. The North Central region had the most respondents to the survey with 32 per cent.

'THERE ARE TOO MANY PACKAGING-RELATED TRADE SHOWS, SEMINARS AND EXHIBITIONS.'



Contrary to the views of packaging suppliers, who feel that there are too many shows, our readers apparently feel they need as much information as they can get.

'MOST NEW PACKAGING TECHNOLOGY ORIGINATES IN EUROPE RATHER THAN THE UNITED STATES.'



The controversy over where most of the new packaging innovations originate was debated by respondents. Those who disagreed with the statement won out, but by a narrow margin.

PACKAGING READERS: A DIVERSE GROUP

Periodically over the years PACKAGING has done this salary survey, we've commented on the diversity of the packaging field, and the people who are involved in it.

This year's survey proves it again. Although the industries our respondents belong to break down in roughly the way we would expect (41 per cent in food, another 25 per cent in either pharmaceuticals or industrial products, and the rest scattered over several others), the size of our readers' companies ranges all over the spectrum, from under 25 employees to over 1000. No one company size represents more than 18 per cent of the survey. Clearly, packaging is a vital function in firms of all sizes.

Those involved in packaging also work in a variety of departments. Twenty-one per cent are in engineering departments themselves, with another 4 per cent listing their department as "packaging design."

Research and development claims another 14 per cent; production departments are home to 11 per cent, and purchasing was listed by another 14 per cent. Corporate and general management, and marketing departments together claim 24 per cent of our group. Again, a wide range of today's manufacturing workforce is involved in packaging to some degree.

A whopping 81 per cent of survey respondents reported that the words "package" or "packaging" don't appear anywhere in their titles, or on their business cards—another indication of the way packaging responsibility is spread over several departments in the average company.

Only 25 per cent of the group reported that they spend 75 to 100 per cent of their workdays involved in packaging-related activities. Another 11 per cent spend 50 to 75 per cent of their time with packaging; 23 per cent spend 25 to 50 per cent of their time with packaging; and a full 40 per cent of those responding spend less than 25 per cent of their time in packaging-related activities.

PLEASE RATE THIS ARTICLE

How would you rate this article? To reply, circle the appropriate number on the reader service card:

Outstanding	451
Above average	452
Average	453
Below average	454

MELISSA LARSON
Senior Editor

"We'd like to thank all those readers who took the time to answer our questionnaire. If you weren't part of the random test group who were asked to fill one out—we'd still like your opinion. Feel free to write us throughout the year if you have a strong opinion or comment on anything to do with your job in packaging. We're interested!"

CONTROVERSY OVER CFCs

Chlorofluorocarbons (CFCs) used as blowing agents for foam packaging are blamed, in part, for depletion of the ozone layer. However, alternatives are available

By **Mark Spaulding**
Associate Editor

Back in 1974, American scientists began detecting a decrease in the earth's protective ozone layer. They found that deterioration of the ozone was being caused chiefly by chlorofluorcarbons (CFCs), a group of chemicals whose chlorine component can stay in the atmosphere for 100 years.

In response, the U.S. banned the use of CFCs in 1978 from aerosol propellants, the major use for these chemicals in America at that time. In the following decade, however, CFC use increased dramatically around the world as a cooling agent for refrigerators, air conditioners and freezers.

Then, in 1985, a hole was detected in the ozone layer above Antarctica. The seriousness of the situation led 31 nations in May to agree to a 20 per cent cutback on CFC production by 1992.

Despite the U.S.'s lead in eliminating CFCs, an area of concern is the compound's continuing use as a blowing agent for polystyrene foam containers. The two major agents—CFC 11 and 12—have been cited as being "environmentally harmful" by contributing to ozone depletion.

In an important move by one of America's highly visible companies, McDonald's Corp. agreed in August to discontinue its use of polystyrene food boxes and trays made with any type of CFCs. The company's planned 18-month phase-out of these containers at domestic restaurants may be extended to McDonald's international outlets as well.

The change affects only the manufacturing process. McDonald's will continue to use similar foam polystyrene products, and consumers will not be able to see any difference in the packaging itself.

"We have completed our review with considerable input from our packaging suppliers and other industry experts," said Clifford Raber, McDonald's vice president for governmental relations, "and have concluded that there are reasonable alternatives to possibly harmful CFCs."

These alternatives have been in development since 1980. Amoco Foam Products and Mobil Chemical, two major suppliers of foam polystyrene, have been cutting back on their use of CFCs as a blowing agent.

Amoco has already switched to a proprietary hydrocarbon agent for all its foam food container products.

Mobil Chemical uses three types of blowing agents: a hydrocarbon product, a combination of isopentane and CO_2, and CFCs. Hydrocarbon-based foam blowing is cur-

Foamed polystyrene packages made with alternatives to CFCs have virtually the same properties as those made with CFCs, according to industry experts.

rently limited to containers that do not require high-performance characteristics. Mobil's fast-food containers use the isopentane blend, and food trays for breakfast items such as scrambled eggs and sausage are still manufactured with CFCs.

The physical characteristics of PS food containers made with alternative blowing agents are not radically different from those made with CFCs, according to George Gaylo, manager of foams manufacturing for Mobil Chemical.

Gaylo said Mobil currently uses CFCs for less than 15 per cent of its overall foam polystyrene production, and that the company will be completely phased-out of CFC-blown products by the end of 1988.

Currently, the House Ways and Means Committee and the Senate Finance Committee are considering a proposal to tax the use of CFCs based on their ozone depletion potential. The proposed tax would start at $1 per pound next year and rise to $3 per pound in 1990. Similar taxing and banning legislation is pending in a number of state and local jurisdictions.

Many manufacturers, suppliers and consumers of foam polystyrene are expressing dismay at what they believe is the misplaced concern of these legislators. They point out that more than 60 per cent of all foam packaging is already made without CFCs.

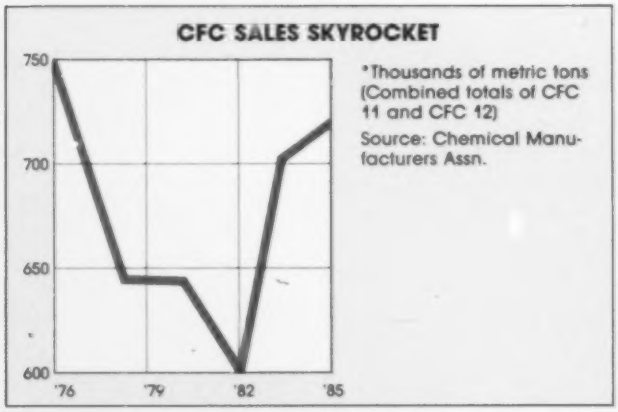
Most users agree that the high visibility of the foam PS packaging has magnified the problem in the eyes of government regulators.

"Your visibility is worse than your real share of the problem," said Bill Franklin, solid-waste disposal consultant. Franklin recently spoke at an environmental seminar sponsored by the Foodservice and Packaging Institute. To combat the misconceptions, Franklin said it will be necessary to develop figures and statistics showing the real relationship of the packaging to the problem. ■

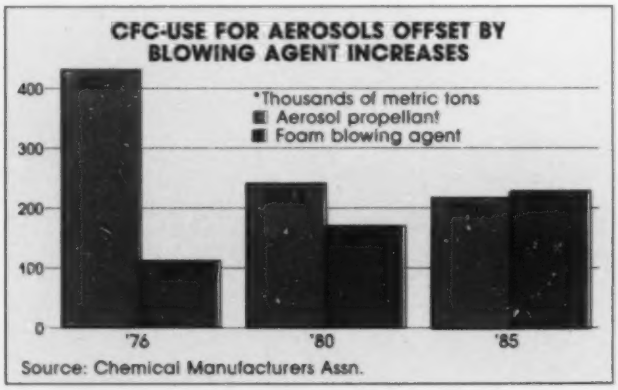
PLEASE RATE THIS ARTICLE

How would you rate this article? To reply, circle the appropriate number on the reader service card:

Outstanding	**460**
Above Average	**461**
Average	**462**
Below Average	**463**



The ban on CFC propellants has been offset by its growth for cooling systems and foam blowing agents.



Extensive use of CFCs for manufacturing foam plastics increased 106 per cent from 1976-1985.

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76, 77, 80, 81, 83, 87, 89-91,

94, 95, 98, 99, 103

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Returnable PET Bottle

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Special Report: Films & Resins

PACKAGING

Here's an idea that 'can't miss'

One feature article in this issue describes "8 Hot Trends in Food Packaging." As might be expected, one of the trends is microwavable packaging. Clever use of susceptors built into packages is spurring new growth for microwave packaging. But susceptors are only the tip of the iceberg. Many different techniques and ideas are coming forth—everything from milkshakes to corn-on-the-cob is now being sold in specially-designed packages for microwave ovens.

Another trend is controlled atmosphere packaging (CAP). Some interesting developments have quietly taken place with CAP. Many of the applications have been in institutional markets, therefore, CAP has not been highly visible. Nor will it ever be highly visible, simply because of the nature of CAP. But as attention turns to the retail level, much more publicity will be generated than now.

Another trend in packaging involves high-barrier plastic containers, particularly retortable plastic containers. Three companies recently making news with retortable plastics for food are Hormel, Del Monte, and The Dial Corp. Stay tuned for many more developments in this area.

Meanwhile, the trend continues to tamper-evident food packaging. In PACKAGING's 1987 Consumer Survey, 31 per cent of the respondents said they avoided purchasing products during the past six months because tampering appeared to have occurred with the packages.

Other packaging trends described in the article are aseptic packaging, single-serve packaging, and life-style packaging.

In reviewing the trends, an interesting thought arises. What would happen if all the trends were combined into one package? Would that produce an item that can't miss? . . . Or would it produce disaster?

Actually, combining many of the trends into one concept is not so far-fetched. In fact, as many as six and seven of the trends are being combined into many of today's most successful new products and packages. Keeping these trends in mind is an integral part of developing a package that "can't miss."

EDITOR

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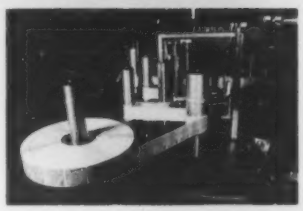
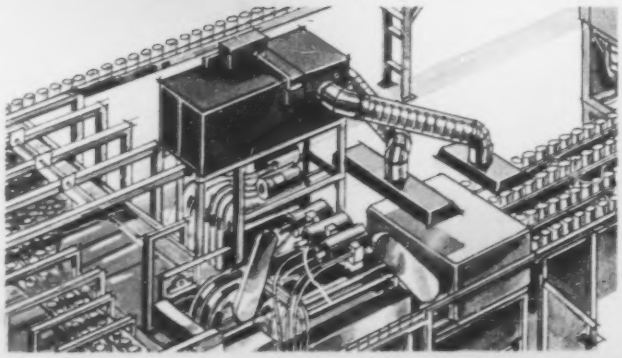
Food Packaging Trends
Eight of the hottest trends are described.
Page **40**

Returnable PET Bottle
Coca-Cola has an interesting test underway in Germany.
Page **10**



Labeling Report
The "state of the art" for labeling is reviewed.
Page **60**

New Canmaking System
Two-piece cans are made for 15 per cent less.
Page **118**



CONTENTS

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A CAHNERS PUBLICATION VOLUME 32 NUMBER 14

PACKAGING NEWS

Coke aims for 20 trips with PET bottle 10
Tests of the returnable bottle look successful; molding may soon shift from U.S. to West Germany

Polycarbonate clarity chosen for retail bottled water 14

Fresh lunch meat line finds test-market success 15

Candy packages sweep Golden Mummy awards 16

PACKAGING FEATURES

SPECIAL REPORT

8 Hot Trends in Food Packaging 40
Here's a review of the latest innnovations sweeping food packaging for today and tomorrow

PACKAGING OPERATIONS

Plant of the Month: New lines handles tough jobs 50
Close inspection, novel infeed system protect and hold loose decks of cards for cartoning and wrapping

STATE OF THE ART

Labelers are faster, more reliable 60
On-line label applicators are faster and more accurate than ever before

SPECIAL INSERT

Plastic Films and Resins 69
How the highly versatile family of packaging films looks today . . . and the shape of flexible things to come

Polyethylene: Not one film but many 70

Polypropylene: A commodity no more 76

PVC: Esthetics and security 80

Polyester: Microwaves and metal 83

Nylon: One tough barrier 87

Cellophane: Alone in a plastic crowd 89

Co-Extrusions: More reliable, more complex 90

Laminations: Doing what co-ex can't 94

Metallizing: Performance and pizazz 98

Barrier Films: Satisfying increased demands 103

A Bright Future 105

Quick Reference Chart 110

PACKAGING TECHNOLOGY

Canmaking system saves 15% 118
Two-piece cans are made with less equipment and less labor with production speeds at 900-1,500 per minute

New EVOH triples barrier 123
A family of new EVOH resins uses a blend technology to achieve 300% better gas barrier

DEPARTMENTS

EDITORIAL	5	**NEW EQUIPMENT**	136	**PACK MART**	141
PEOPLE	18	**NEW MATERIALS**	137	**CLASSIFIED ADS**	142
ASSOCIATION NEWS	32	**ADVERTISERS INDEX**	141	**WRAP UP**	148

PACKAGERS IN THIS ISSUE

Armour Processed Meats	15	Hoody Corp.	16	Phillips 66	15
Coca-Cola	10	Kraft, Inc.	14	The Pillsbury Co.	15
Fantasia Industries	14	Interbake Foods Ltd.	16	Stanley Tool Co.	28
Galaxy Cheese Co.	16	Merck & Co.	28	Tea from Trumps	16
Gerber Products Co.	14	Miller Brewing Co.	14	U.S. Playing Card Co.	50
The Gillette Co.	29	Orbit Chemical Co.	29	Whitman's Chocolates	16

PLASTIC FILMS & RESINS

Accelerating developments in resins and blends of resins. Rapid improvements in laminations and co-extrusions. Sweeping advances in barriers—transparent and opaque. Frequent changes in consumers' wants and packagers' marketing strategies.

It's no wonder that flexible films are replacing rigid containers throughout the world of packaging.

With increasing demand comes steadily diminishing supply and rising prices throughout the industry. Luckily for suppliers of films and film resins, low-cost packaging is not their customers' only goal.

As one representative of a leading film manufacturer put it, "In light of continuing price jumps, it's no longer true that film is a cheap alternative to metal and glass. But now, it must be considered a creative alternative."

Here, then, is PACKAGING magazine's comprehensive report on the highly versatile family of packaging films as it looks today . . . and the shape of flexible things to come. ■

CONTENTS

Polyethylene	70
Polypropylene	76
PVC	80
Polyester	83
Nylon	87
Cellophane	89
Co-extrusions	90
Laminations	94
Metallizing	98
Barrier Films	103
A Bright Future	105
Quick Reference Charts: Film and Resin Manufacturers	110

POLYETHYLENE

NOT ONE FILM BUT

Exotic resins and complex co-extrusions meet a wide range of packaging needs

What appears to be ordinary PE is actually highly engineered.

In packaging markets for polyethylene film, every use requires something different. PE resin is becoming a variety of custom resins, since customers are becoming increasingly demanding. Exotic resin formulas and complex co-extrusions are continually being developed to satisfy specific packaging needs.

For instance: Although PE has long enjoyed a reputation as a moisture barrier, one resin and film manufacturer has succeeded in developing an HDPE film that has twice the water vapor transmission rate properties as commodity-grade HDPE—from a commodity high of 0.35 to a new low of 0.18 for 1-mil films. Additional polyethylene research and development is being directed toward improving oxygen barrier properties.

Deceptive packages

A couple of examples of recently introduced packages help to illustrate the growing complexity of PE-based applications.

One is the diaper bag that has replaced the folding paperboard carton. The end user realized considerable savings in going from paper to plastic, but the plastic itself did not come easy.

The goal was something that sparkled, something that would catch the consumer's eye. Increased amounts of

MANY

EVA resins were added to contribute that sparkle. The EVA raised the film's impact strength.

Even to some packaging professionals, the film used as a feminine napkin overwrap can appear commonplace. In reality, it is a highly engineered polyethylene product: A three-layer co-extruded film made of varieties of LLDPE with blends and laminations. The reason for all the blending and layering is that the overwrap was to be a very soft, "feminine" film.

A small but exciting potential growth area for PE-based co-extruded films is lidding/overwrap for the controlled-atmosphere packaging of fresh meats, poultry, fish, pasta, and eggs. One film co-extruder is now combining an EVOH barrier, an EVA seal layer, and a proprietary anti-fog additive with LDPE for this purpose.

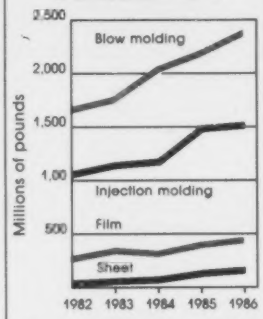
Polyethylene is also making packaging headlines as a major component of reclosable zipper-top liners for cereal boxes. The companies involved in its R&D foresee applications far beyond cereal.

But film used for bags and carton liners is not ordinary PE, either—or will not be for long. Competition for this burgeoning market is heating up, and materials suppliers are jockeying for position. One manufacturer of PE resins said that some packagers have expressed concern that odors and/or tastes might migrate from PE film into products packaged in film-lined cartons. That company has been touting its ability to produce resins that ameliorate those problems.

Alphabet soup

New to the polyethylene alphabet soup—which until recently comprised PE, HDPE, LDPE, and LLDPE—is ULDPE, or ultra low-density polyethylene. Among the

HDPE DOMESTIC CONSUMPTION

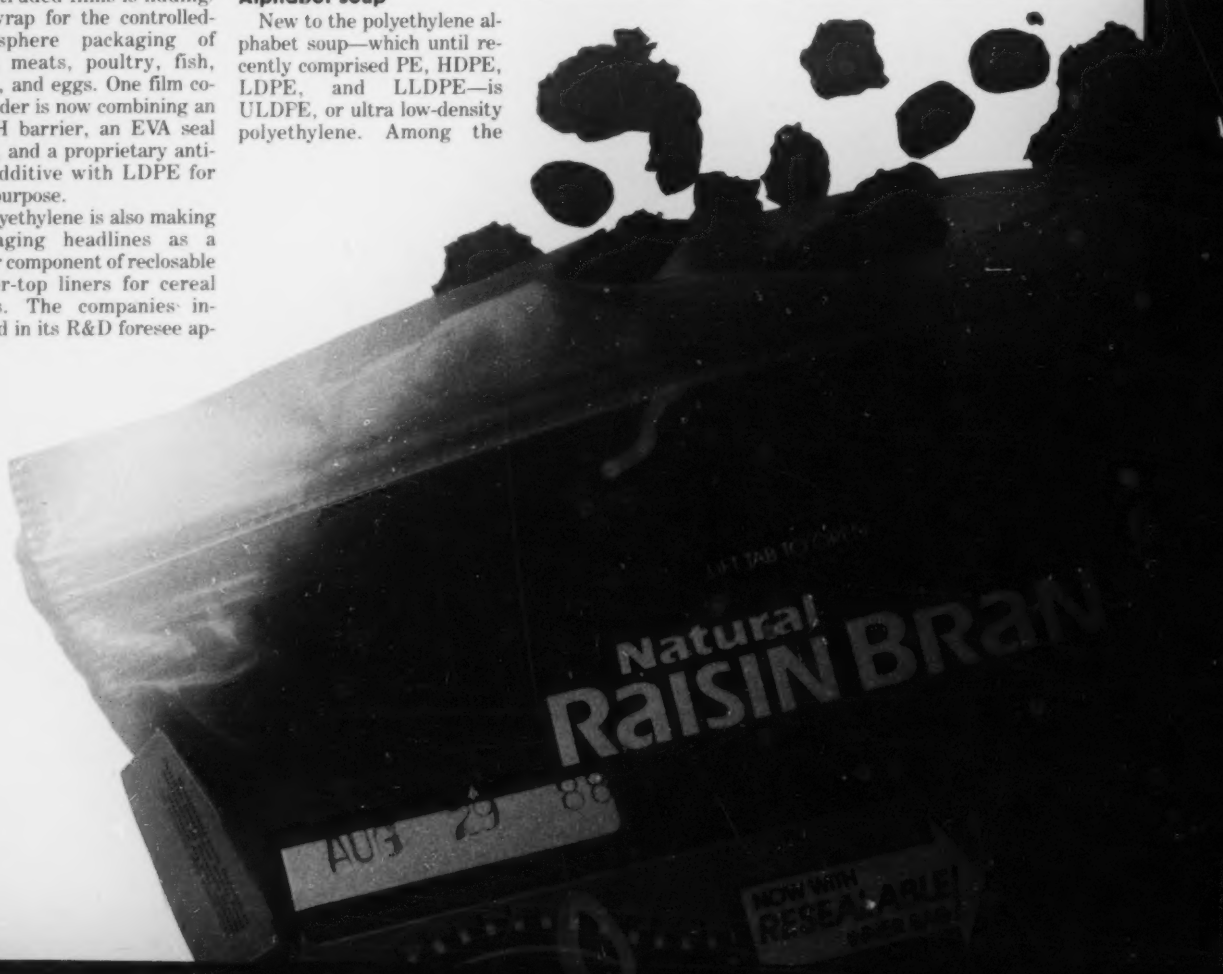


Source: Society of the Plastics Industry

1987 HDPE CAPACITY MILLION LBS. RESIN

Phillips	1,380
USI*	1,240
Soltex*	1,050
Allied	1,020
Cain	890
Chevron	575
Amoco	350
Union Carbide*	350
Dow	330
Hoechst	250
Himont	30

*HDPE capacity can be used to manufacture LLDPE.
Source: Industry estimates



POLYETHYLENE

ULDPE—ultra—is the newest addition to polyethylene's alphabet soup

properties that make ULDPE unique are increased resistance to punctures and tears, low-temperature sealing and therefore faster sealing rates, increased hot-tack strength, high flexibility, increased clarity, and minimal taste and odor migration.

ULDPE appears likely to earn a place as a significant polymer for co-extrusions. It is not lower in cost per inch or per pound of resin, but users may realize savings in fabricating the overall package as a result of film downgauging.

Potential uses for ULDPE: Co-extrustions of PP and HDPE with ULDPE instead of EVA to improve heat sealing of such materials as cereal box liners; laminations with HDPE and barrier layers for bag-in-box applications; and low-temperature applications such as bags for yogurts, ice cream, and frozen beverages.

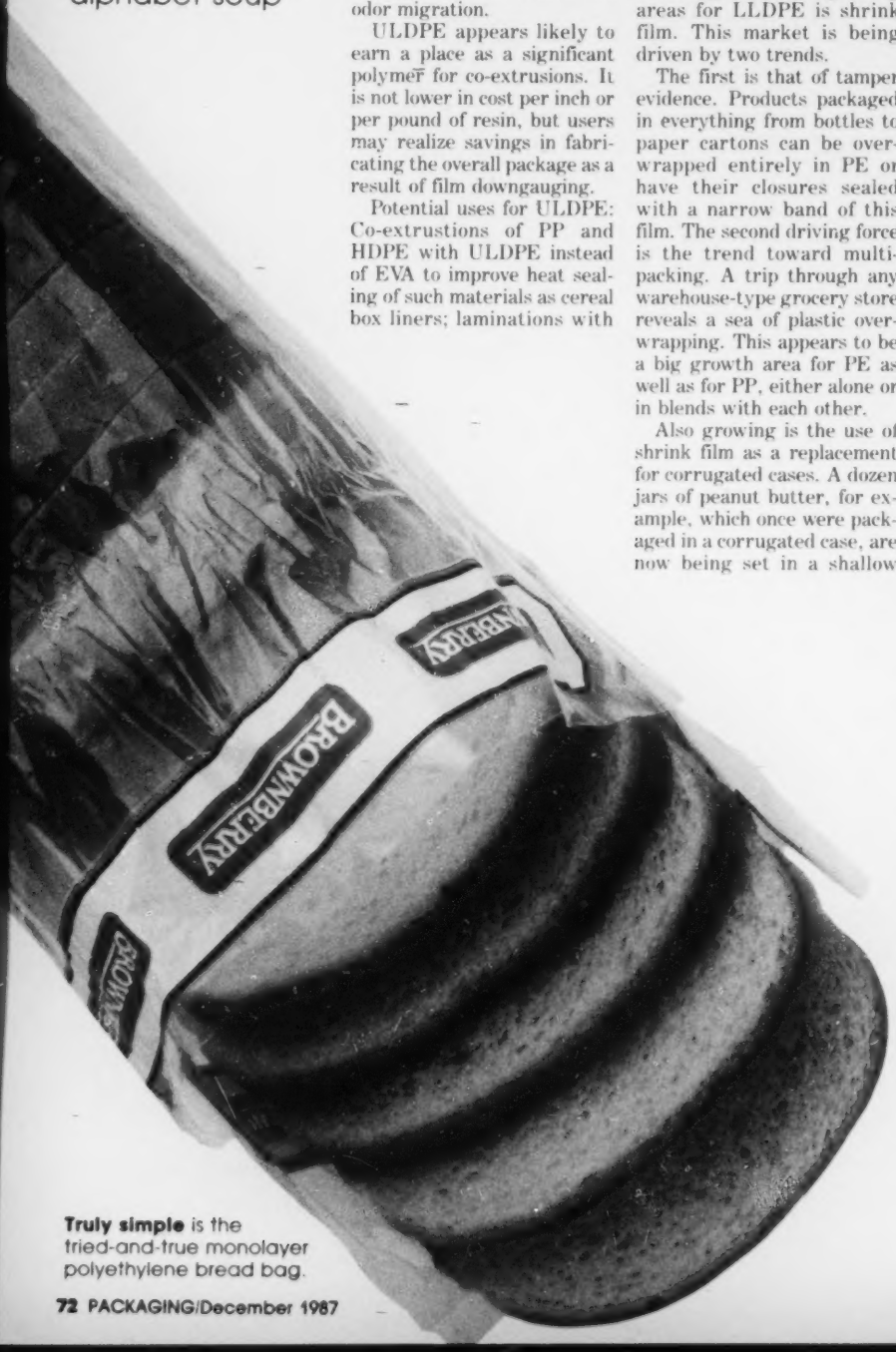
Trends in shrink film

Among the fastest-growing areas for LLDPE is shrink film. This market is being driven by two trends.

The first is that of tamper evidence. Products packaged in everything from bottles to paper cartons can be overwrapped entirely in PE or have their closures sealed with a narrow band of this film. The second driving force is the trend toward multipacking. A trip through any warehouse-type grocery store reveals a sea of plastic overwrapping. This appears to be a big growth area for PE as well as for PP, either alone or in blends with each other.

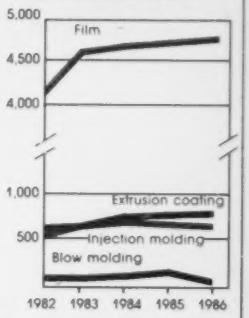
Also growing is the use of shrink film as a replacement for corrugated cases. A dozen jars of peanut butter, for example, which once were packaged in a corrugated case, are now being set in a shallow corrugated tray or even on just a single sheet of corrugated and being shrink-wrapped—often at a big saving.

Beyond merely tying two or three previously packaged products together, PE shrink film is also being used as primary packaging for fresh red meats, poultry, and cheese. This film provides the excellent water barrier properties inherent in PE as well as excellent oxygen barrier characteristics through the addition of EVOH or PVDC. Moreover, one film extruder is marketing an aroma-barrier shrink film. ■



Truly simple is the tried-and-true monolayer polyethylene bread bag.

LDPE DOMESTIC CONSUMPTION



Source: Society of the Plastics Industry

1987 LDPE CAPACITY MILLION LBS. RESIN

USI	1,785
Dow	955
Chevron	905
DuPont	705
Eastman	615
Westlake	585
Exxon	580
El Paso	550
Union Carbide	550
Mobil	500

Source: Industry estimates

POLYPROPYLENE

A COMMODITY NO

Resin and film suppliers are turning the PP market into one of specialty items

Traditionally, polypropylene has been regarded as a commodity. It still is in some markets. For nonpackaging uses, one supplier's PP is virtually indistinguishable from another's, and therefore most of it is purchased chiefly on the basis of price.

However, in the world of packaging, as increasingly reliable high technology becomes available, the distinction between various manufacturers and the techniques they use to boost performance of their packaging-grade resins and films are becoming more evident and more important.

Clearly, one industry trend is toward greater diversity: Resin manufacturers are looking for ways to differentiate their products and make the PP market more of a specialty business than it has been.

In the introduction of improved PP resins, Japan appears to be leading the U.S. by perhaps as much as 10 years, according to one major player in the industry. However, American companies are accelerating their research and development.

Improving performance

Among the new properties being introduced by domestic suppliers of PP are films offering reduced sealing temperatures, haze, and taste and odor migration. Even in light of these advances, the nature of PP is not changing as quickly as are the methods of making it. Many companies are working on ways of producing PP less expensively than before.

New resins and blends of resins with additives that give films low sealing temperatures are an industry-wide goal, since end users are looking for improved heat-sealing characteristics. Melting points are dropping. That is a benefit to converters who have equipment that can handle these low-temperature films.

An especially versatile PP is available in Europe. It has two sealing layers—one low temperature and one extremely low temperature. This makes the film adaptable to a wide range of machinery.

Snacks lead the way

Annual growth of 7 to 10 per cent for PP as a packaging film seems realistic. Within packaging, the biggest market is food. And within that, the largest share is in snacks and confections.

Cookie makers see OPP as a solution to the problem of wax buildup on machinery used for glassine. And traditional users of cellophane are moving away from that film into OPP. Snacks packages sometimes have two or three layers of biaxially oriented PP combined with EVOH and metallizing.

Growing dramatically as a replacement for paper is opaque white OPP. Although this expanded-core film does not provide the ultraviolet-

MORE

light barrier of metallized film, it is in some applications competing directly with metallized on the basis of price. White OPP can simulate the appearance of metallized film when it is printed with transparent ink.

Low haze, high gloss

New to the PP film marketplace is one heat-sealable OPP film that offers higher gloss and lower haze than conventional films. This promises to increase the trend toward overwrapping of packages in PP shrink film.

Cigarettes, ice cream, butter, and margarine are three products presently being overwrapped this way. Tests have shown that weight loss of dairy products is significantly reduced when they are overwrapped in film. Tamper-evident benefits are also part of this trend.

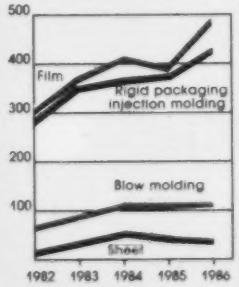
A fringe benefit of this kind of overwrapping is the glossy look, which presents the product as a high-end, prestige item. In addition, there is a growing trend toward the packaging of, for example, a toothbrush along with the tube of toothpaste, a bottle of shampoo and a bottle of conditioner, and a beverage in a paperboard carton with attached drinking straw.

Produce and fruit could well prove to be the next foods to benefit from PP shrink-wrapping. Single fruit items such as individual oranges are handled repeatedly from the grove to the home. A growing consumer concern about disease transmission is prompting at least one film supplier to market its film as an overwrap for oranges and other fruits one by one.

Another benefit of this kind of overwrapping is longer shelf life. If an orange is wrapped before bacteria begin to form, its shelf life can be extended to perhaps three months. The export market would benefit greatly. Furthermore, this overwrapping film could be pre-printed so that the shrink-film-wrapped orange would arrive at the grocery store complete with the grower's name in place. ■

Replacing paper in confections and snacks are two forms of PP: expanded-core and metallized.

PP DOMESTIC CONSUMPTION



Source: Society of the Plastics Industry

1986 PP CAPACITY MILLION LBS. RESIN

Himont	1,500
Amoco	1,000
Shell	800
Exxon	690
Aristech	515
Fina Oil	450
El Paso	350
Soltex	300
Phillips	250
Eastman	140

Source: Society of the Plastics Industry

PVC

ESTHETICS AND SECURITY

Overwrapping serves as barrier, boosts sense of safety, and adds touch of class

Leading the news in the polyvinyl chloride market are three major trends: tamper evidence, carton overwrap, and a new film manufacturing technique for in-store meat and produce film.

Shrink bands expand

One of the most recent and significant uses of biaxially oriented PVC is the tamper-evident shrink band of the type seen now on glass jars of mayonnaise and peanut butter as well as plastic cups of cottage cheese.

In 1985 the market for this type of band (combined with PVC shrink labels) was $50-55 million. In 1986 it grew close to $80 million. By the end of 1987, it could exceed $100 million.

So far, one category of foods—juices and other beverages in wide-mouth bottles—has not taken up the shrink neck band. Chances appear good that it will: At least one major PVC supplier is presently expanding production capacity solely to accommodate this application.

As use of the shrink band increases, competition among suppliers of the banding film will increase, too. One beneficial effect is downgauging—from 3 mils to 1.5 mils and eventually to 1 mil—as a means of reducing cost.

PVC is likely also to gain in popularity as a whole-carton overwrap. Some candidates for this overwrapping are breakfast cereal, pancake mix, and frozen-entree cartons. This PVC overwrap will help prevent tampering; additionally, it will give the packages the glossy look that speaks to the consumer of upscale contents.

A sleeping giant

In-store packaging of meats and produce consumes 100-110 million pounds of film annually—and it is almost exclusively PVC. The film could quickly command a large share of the pre-packaged fresh fish and poultry market, too.

Also, fresh produce requires most of the same film characteristics required by fresh meat. Approximately 25

In-store wrap, carton overwrap, and shrink bands make wide use of three different formulations of PVC.

million pounds of PVC is now sold into the produce market. The total could reach 200 million pounds, said one PVC manufacturer, if the "sleeping giant," produce, awakes.

Two factors account for the widespread belief that the giant is stirring. One is continued consumer demand for utmost convenience. Imagine how greatly check-out line efficiency would increase if produce items, packed in PVC-overwrapped trays complete with UPC code labels, no longer had to be weighed separately. Another factor is the health issue. Fresh produce in the store is the only food product that can be touched directly by everyone. An overwrapping of film would help reassure the consumer that much was being done to improve the cleanliness of these produce items.

Another convenience item representing a growth opportunity for PVC would be produce-based assortments such as carrot and celery sticks and califlower sprigs packaged together with a dip in a tray.

One manufacturer of PVC film for in-store wrapping applications has announced a new manufacturing procedure which combines technologies from Asia, Europe, and the United States. The new film is said to offer improved clarity, tensile strength, and elongation at no increase in price over traditional blown film.

Also being introduced is a new resin for meat-wrap PVC film. The performance benefits of film made from this resin include exceptional clarity and sparkle, as well as a widened processing window. Its melting point is 310° F.—70 degrees lower than other PVC films.

According to its manufacturer, this is a porous resin, which allows film makers to quickly rid it of residual vinyl chloride monomer during the compounding operation, helping ensure that the film will meet extremely low FDA limits for RCVM.

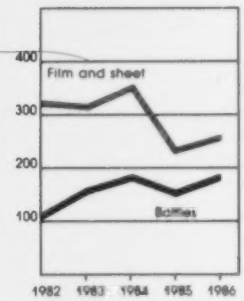
In Europe there is concern about plasticizers used in PVC and their potential migration into foods. That could steer packagers away from rigid PVC to other materials. However, this issue seems to be felt as no threat in flexible packaging.

Said the spokesperson for one large producer of PVC film, "We don't see a problem with the FDA in markets in which PVC is already in use. For meat overwrap and intravenous solution bags, for example, the problem is negligible. In bottles, we have another issue altogether, but for flexible, it is almost a non-issue."

A bigger issue for PVC domestically, it seems, is what can be done to increase resin supply and bring stability to rising prices. Use of PVC in all packaging uses is increasing, despite a slight dip in 1985. Usage has grown from 424 million pounds in 1981 to 572 million pounds in 1985.

At present, no new capacity appears to be coming on stream. ■

U.S. CONSUMPTION PVC



Source: Society of the Plastics Industry

1987 PVC CAPACITY MILLION LBS. RESIN

BF Goodrich	1,650
Occidental	1,520
Shintech	950
Georgia Gulf	850
Borden	800
Vista	715
Air Products	500
Certain-Teed	220
Goodyear	110
Vygen	100

Source: Society of the Plastics Industry

Clear in the oven or metallized in a box, PET film is growing in use.

POLYESTER

MICROWAVES AND METAL

Ovenable and easily metallized, PET film benefits from multiple packaging trends

What do microwavable popcorn and bag-in-box apple juice have in common? Aside from the fact that they go well together as a round-the-tv snack, they illustrate two big uses of polyester film.

It is estimated that by 1991 microwavable packaging for popcorn and pizza alone will reach nearly $92 million. PET film probably will be riding that wave, since it is a component of microwave packaging for foods requiring metallized-film susceptors—such as pizza and popcorn—and of lidding for dual-ovenable foods.

Another use of metallized PET is in the snacks packaging field, as a competitor to metallized OPP. And in metallized form, PET is also providing the needed barriers in some bag-in-box applications. PET has long been considered one of the best of all plastic films for metallizing.

Just as expanded-core OPP is being used instead of metallized film to give a package a metallized-like appearance, metallized PET may soon see some competition from expanded-core PET. This film combines the pearly look of the OPP with the barrier qualities of the PET. At the moment, expanded-core PET is not priced competitively enough to pose a threat to expanded-core OPP.

Metallized PET is growing in snack food and confection areas. Among the newest developments in this area is a heat-sealable PET for metallizing. It is now at the market-introduction stage.

Barrier properties

The increasing interest in organoleptics is also stimulating usage of PET in composite cans for orange juice. And the same scalping that can occur in orange juice cans having polyolefin food-contact layers can happen in pouches that utilize polyolefins as sealing layers. Powdered foods, dried fruits, and other foods in pouches—just as sensitive to scalping as orange juice—represent new markets for PET film.

In the growing market for lidding materials, one film producer has been highly successful with heat-sealable PET. Another major player has been working on a heat-sealable, peelable PET lid for dual-ovenable trays. Both offer advantages over PET materials that make use of adhesives, since the adhesives may migrate.

PET is also benefiting from the move toward glossy reverse-printed paperboard cartons of the sort used in packaging dishwasher detergent cartons. Additional applications seem likely as the consumer begins to fully appreciate the particularly glossy look of PET film-overwrapped packages.

Labeling boom

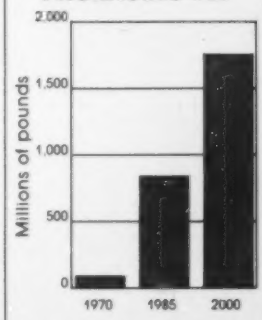
Another significant PET film use to have blossomed during the past five years is shrink-film labeling. These labels afford especially attractive graphics. And, if they are used simultaneously as a shrink-band closure overwrap, they make the package tamper-evident, too. ■

1986 U.S. PET FILM SALES PACKAGING, MILLION LBS.

DuPont	24
ICI	10
Hoechst	8
Imports/Others	9

Source: Industry Estimates

U.S. DEMAND FOR PACKAGING PET



Source: Society of the Plastics Industry

NYLON

ONE TOUGH BARRIER

Nylon's role in packaging dry and fatty foods is likely to grow with the debut of two new films

Two recently introduced forms of nylon hold promise of enlarging this tough material's role in flexible packaging. Each of the new films is said to offer improvements in the already good clarity and barrier properties of earlier types.

Amorphous nylon

The manufacturer of amorphous nylon—who just won FDA approval for its use with dry foods, fatty foods, and dry foods containing oils—is still awaiting FDA approval for other foods uses. In the meantime, the company is actively pursuing the meat-packaging market.

As an oxygen barrier, amorphous nylon is said to be better than PET and HDPE films. Although it is not as good an oxygen barrier as EVOH, at approximately $1.60 a pound it is less expensive and moisture-sensitive than EVOH.

Amorphous nylon is a non-scalping flavor and aroma barrier on its own. It can be used to boost these properties in multi-layer co-extrusions.

Biax nylon

The first and only U.S. plant for manufacturing biaxially oriented nylon opened last spring, bringing domestic capacity to nine million pounds a year. A few months ago, Japan was the sole source.

Biax nylon, a monolayer film, offers better machinability and printing as well as higher strength and transparency than non-biax nylons. Positioned in part as a competitor to PET and OPP films, biax nylon is being launched as a packaging film for cheeses, meats, frozen foods, coffee, and foodservice liquids.

Fresh opportunity

Fresh meat represents a new opportunity for nylon. Meat containing bones is seen as a prime candidate for nylon-film packaging, since nylon is particularly puncture-resistant. Experience with this product has led nylon film suppliers to compete with PET film in packaging confections such as granola bars, which also have sharp, abrasive edges. In metallized form, nylon is going head-to-head with metallized PET in coffee "brick" packaging.

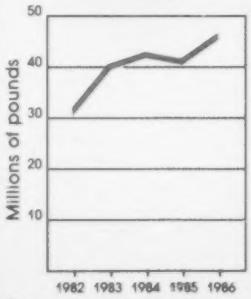
Another growing application for nylon—often with a PVDC coating—is in controlled-atmosphere packaging. This takes two forms: in the film laminated to paperboard trays and as lidding.

Benefiting from the continuing push for consumer convenience, nylon is moving more forcefully into boil-in-bag applications. An improvement in the sealants and tie layers used in nylon-based co-extruded films is helping. Characteristics that make nylon co-extrusions suitable for boil-in-bags also have applications for pouches containing wine and foodservice condiments.

One major film co-extruder has launched a new multilayer nylon film for flexible pouch packages of pumpable foods. It is a co-extruded film incorporating polyolefins and EVOH plus nylon. ■

Coffee and processed meats are big users of nylon—in laminated and co-extruded form.

U.S. CONSUMPTION NYLON FILM, COATING



Source: Society of the Plastics Industry

1986 NYLON CAPACITY MILLION LBS. RESIN

DuPont	230
Allied	110
Monsanto	80
Hoechst	40
Atochem	31
Wellman	24
Nylon Corp.	22
BASF	20
Custom Resins	20
Emser	10

Source: Society of the Plastics Industry

CELLOPHANE

ALONE IN A PLASTIC CROWD

New technology and salesmanship may be able to keep this unique film competitive

There is some news to report about this decades-old packaging film. Innovations in manufacturing technology and marketing strategy hold promise of keeping cellophane viable.

One innovation is the recent technological advance in cellophane manufacture that is now reducing the cost of cellophane fibre—not film—made overseas. If used to make film, the new process could bring the cost of this packaging material down near that of PP. Yet the consensus among suppliers of cellophane and plastic films appear to be that, even if the price drops significantly, the market for cellophane will remain flat.

Dedicated users

More than a few packagers are dedicated users of cellophane. They prefer this film's feel, gloss, clarity, rigidity, printability, and machinability. More important, they own machinery that cannot accommodate any film that melts.

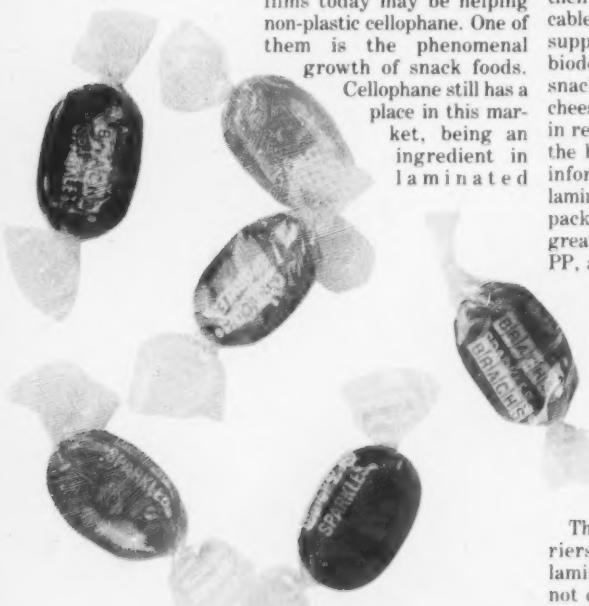
Some of the trends that are benefiting plastic packaging films today may be helping non-plastic cellophane. One of them is the phenomenal growth of snack foods. Cellophane still has a place in this market, being an ingredient in laminated wrappers. Pop-at-home popcorn also is a positive influence on cellophane, which is a good barrier to oils and which does not melt.

In addition, a philosophical factor may be working in cellophane's favor. Growing interest in the clean disposal of municipal waste could give cellophane a marketing leg up on its plastic film competitors, for the non-plastic film is the only transparent film that is biodegradable.

Ironically, in order to make their film more widely applicable than before, cellophane suppliers have made it less biodegradable. Packagers of snacks, candy, cookies, and cheese are expessing interest in reinforced cellophane and the brand-new metallized reinforced cellophane. These laminates owe their improved packaging capabilities in great part to layers of PET, PP, and plastic adhesives.

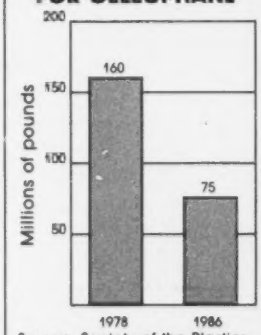
Metallized cellophane—actually, metallized PET sandwiched between layers of cellophane and polymer coatings—is a prime candidate for candy, dried foods, snacks, nuts, and coffee.

The benefits of superb barriers offered by cellophane laminates of these types do not come cheap. Cellophane coated with either PVDC or nitrocellulose currently sells for approximately $2.00 a pound. Metallized cellophane runs roughly $2.70. ■



Cellophane remains in use as a monolayer for candy and in laminations for cheese.

U.S. DEMAND FOR CELLOPHANE



Source: Society of the Plastics Industry

1987 CELLOPHANE CAPACITY MILLION LBS.

Flexel (USA)	90
Cydsa (Mex.)	22
BCL (Can.)	20

Source: Industry estimates

CO-EXTRUSIONS

MORE RELIABLE,

Better adhesives, by allowing better film composites, are enlarging the role of flexibles

Many resin manufacturers agree that much of the innovation in flexible-films packaging today occurs at the level of the film co-extruder.

After several years of intense research and development, a balance has been achieved between highly specialized resins, sophisticated co-extrusion equipment, and savvy marketing techniques.

Not long ago, users of traditional films who tried co-extrusions soon wished they had not. Quickly, many companies in the co-extrusion business stopped referring to their films as co-extrusions and created their own brand names for them. This strategy worked well over the years for the makers of branded films and their nonbranded competitors alike as overall quality rose.

Tight lips

This is a business of secrets—that is, proprietary information. In most cases, there is little dialogue between the companies that produce the plastic resins and the companies that combine those resins into specialized films. "We know what they're buying but we don't have a clue as to how they're using it," said one resin supplier.

The raw materials utilized in developing a sophisticated co-extruded film may come from several different resin suppliers. These resins are

MORE COMPLEX

combined in ways that few co-extruders care to discuss with anyone in detail. However, most of them will say that they would not be able to work their magic without help from better adhesive, or tie, resins.

Co-extrusion resins used with the correct tie layers allow the mixing of apples and oranges. Diverse film resins can be teamed up to create a single film that is more than the sum of its parts.

This business of co-extrusion tie-coat adhesives is a thriving one. A recent estimate pegs its annual growth at an average 33 per cent. And sales of co-extrusion adhesives are expected to increase from $7 million to almost $30 million over the next decade.

Improvements in ties

Several leading resin manufacturers have been working on significantly improved tie layer resins, and with great success. One company has developed a high-barrier PVDC adhesive which combines good bonding strength, good water vapor transmission rates, and good oxygen barrier. Another has developed LLDPE resins for use in tying LLDPE to nylon layers for boil-in-bags, plus PP-based resins which tie EVOH or nylon layers to PP for retortable food packages.

Manufacturers of products that once were packaged in something as basic as glassine are moving quickly to co-extrusions. And in their effort to continually add value to the films they make, co-extruders are working on increasingly complicated structures.

For example, a film structure can begin with a barrier material that does not readily adhere to the desired plastic film resins. The barrier must therefore be co-extruded with an adhesive resin on either side. On one side of this three-layer co-extrusion could be a layer of prolypropylene; on the other, polyethylene.

Some converters and film extruders are making films that have five, seven, and even 11 layers.

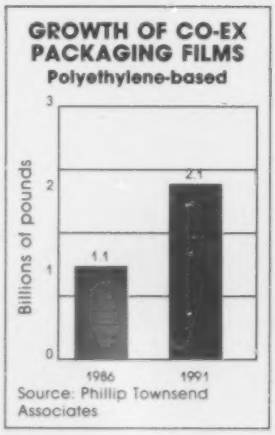
Who needs 11 layers?

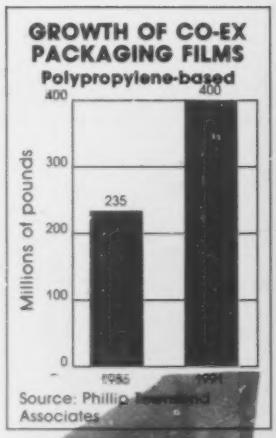
What kind of product needs an 11-layer film? Foods such as snacks and dairy products may, because they are subject to multiple damaging forces. Even the simplest-looking snacks package is in reality complex. There may be a layer of white PE because white is best for printing. Co-extruded with this layer might be a layer of brown PE to keep sunlight out, EVOH as an oxygen barrier, and then a layer for low-temperature sealing.

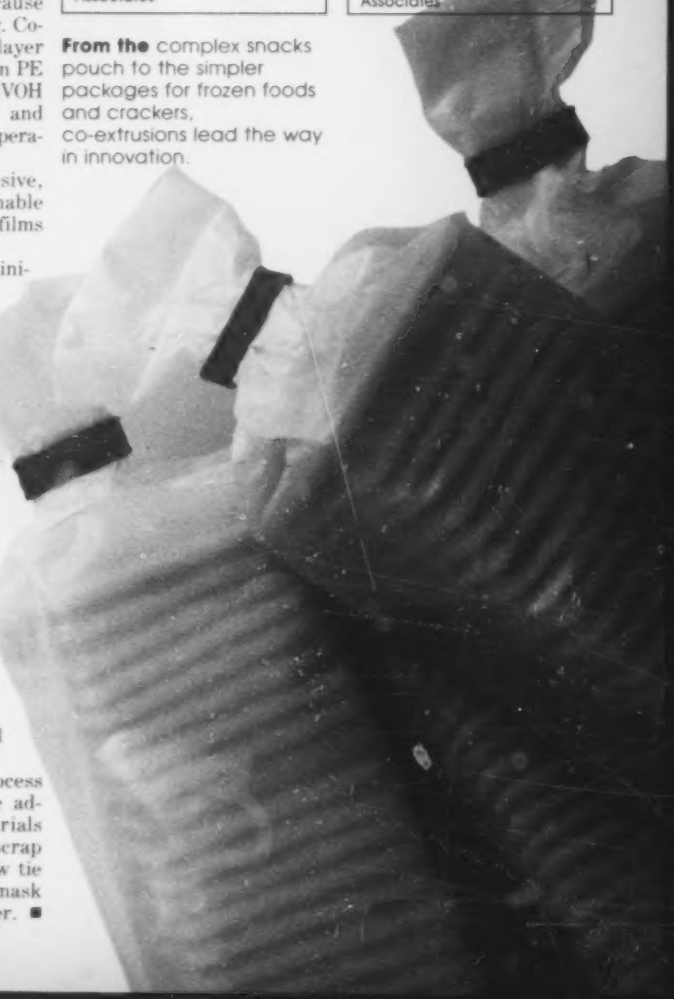
The process is expensive, but several factors enable makers of co-extruded films to keep costs down.

Co-extrusion can minimize the use of expensive resins by reducing their layer thicknesses to as little as three microns. Furthermore, sophisticated co-extrusions can incorporate one or more commodity resins —PE or PP—as a structural layer. Co-extrusion enables converters to start with resin instead of film, which eliminates production steps by extruding all the resins at once.

The co-extrusion process produces scrap. Before advanced tie-layer materials were developed, such scrap was utterly useless. Now tie layers can be used to mask both sides of a scrap layer. ■







From the complex snacks pouch to the simpler packages for frozen foods and crackers, co-extrusions lead the way in innovation.

LAMINATIONS

DOING WHAT CO-EX CAN'T

Demand grows for film with foil, paper, plastics, and printing

Just as paper was the flexible packaging material of choice before there was plastic film, lamination was an effective method of combining various substrates before there was co-extrusion.

Now, though, if you talk only with manufacturers of multilayer co-extruded films, you might come away with the idea that coatings and laminations are becoming processes of the past.

This attitude appears sound . . . as far as it goes. Lamination is a multi-step procedure. Each layer, measured in mils, must be sufficiently thick to be handled—to be adhered to the next one. When making co-extruded films, a one-step process, some of the layers can be measured in microns.

And so, the question is, Why would anyone choose to build a film package one layer at a time when the less time-consuming and materials-consuming process of co-extrusion is readily available?

One answer: No one has yet found a way to blow plastic film bubbles with paper, aluminum foil, cellophane, or printed film inside. That means laminations—of plastics to film, plastics to paper, and plastics to foil—will be creating highly versatile, attractive packages for a long time to come.

One such lamination, according to the sole worldwide manufacturer of acrylonitrile copolymer, is more than merely a cost-effective package—it could very well be "the ultimate container." Made of a lamination of acrylonitrile copolymer film to polyethylene and then a lamination of this to paperboard, such a container would provide unparalleled barrier and structural characteristics.

Do-everything adhesive

A leading manufacturer of plastic resins for packaging recently introduced a unique polyester-based adhesive which might go that so-called ultimate container one better. The copolyester is now being commercially extrusion-

Film with paper, film with foil, and film with both are just three of many laminated pouches in wide use.

coated on paperboard. Eventually, it may be used as a coating for foil and polyester film. This resin simultaneously serves as a heat-seal layer, an aroma and oxygen barrier equal to polyester film, and a food-contact surface. Copolyester will undoubtedly prove valuable where more traditional sealing materials such as LDPE present organoleptic problems.

When the goal is a flexible package, plastic films alone are sometimes not sufficient. Reinforced cellophane, for example, is a lamination of plastic and non-plastic films which together provide a look, a feel, and combined barriers that co-extrusions cannot duplicate.

Although glassine is being replaced by plastic film in many applications, considerable amount of glassine is still in use—as inner wrappers for graham crackers, for instance. And much of that glassine is a laminated product: PP on the outside and perhaps PE on the inside.

Other paper is being combined with film in laminations and with film resins in extrusion coating to satisfy a varied group of end users. One converter who specializes in paper pouches touts his company's advances in making paper barrier bags. The company applies four separate coatings of PVDC to paper before laminating this paper to heat-sealable plastic film. Multiple, thin layers remain flexible and help assure that pinholes in the EVOH coats do not line up.

Whenever locked-in printing is the goal—whether the substrates are plastic or non-plastic—lamination is the only process available. In some cases inks must be kept away from the product to avoid migration of solvents. In others, the inks are buried chiefly to prevent scuffing.

One potentially hot new use for printed plastic film laminates is in-store wrapping of such products as microwavable foods. The result is a package that provides the needed barrier as well as a combined "deli" look and store-branded look. Very likely, this would be a five-layer co-extruded film laminated to printed film.

The cost of aluminum foil is increasing dramatically, and therefore foil is being replaced by metallized films. However, aluminum foil is still a crucial component of many flexible packages. And these are laminates.

A big pouch for foodservice ketchup can be made of three layers: oriented nylon, foil, and perhaps oriented PET film.

A similar laminated pouch is expected to be used in the packaging of detergent for single-use applications. These could be laminations of PET, foil, and LLDPE.

Co-extrusions are partners in the continued viability of the lamination business. In stepping up from a monolayer film as a means of extending shelf life, packagers can consider coating that film with a barrier resin such as PVDC. Another step up would be a lamination of that coated film to metallized PE or PP. Next would be a multilayer co-extruded film laminated to the previous lamination, perhaps with a middle layer of EVOH or nylon. ■

METALLIZING

PERFORMANCE AND

Good looks and barriers are crucial to snacks and candy, and metal provides them

No matter who is doing the talking at the time—resin maker, film manufacturer, or converter—whenever the subject of snacks arises, mouths start to water. What has these packaging professionals licking their chops is the stimulating growth rate of the snack foods industry and the sales opportunities it represents. Converters, at the forefront of innovation, are buying heavily into metallizing technology.

When it comes time to discuss particular examples, on the tip of everybody's tongue is the name of one single brand of snacks, for it created a packaging style that other brands have been clamoring to follow. That trendsetter quickly rose to prominence in the marketplace by establishing for itself a high-tech, high-end, high-quality image through flashy graphics . . . and metallized plastic film.

Metallized film once was used primarily for esthetics: the look of foil without the expense. Then interest in this metallic look faded. But recently, metallized film is back, and looking better than ever.

Looks, though, are not everything. If they were, metallized films would probably be in hotter competition than they are with the combination of expanded-core OPP film and transparent inks, which can approximate the appearance of metallics.

More than just looks

The material that has made snacks packaging so glisteningly attractive to the eye has also helped keep them satisfying to the palate. Metallized films provide excellent barriers to, as one converter put it, "all the things that can turn potato chips into soap." This factor proves especially significant when regional snacks distributors go nationwide.

Not long ago, only foil could have provided the needed barrier to ultraviolet light and oxygen. Crazing, flex cracking, and microporosity were major problems for metallized films. The cracks and holes were minute, but from the standpoint of oxygen permeation, they might as well have been the size of portholes. At roughly the point in time that the price of foil began to reach prohibitive heights, advances in metallizing improved the opacity of plastic film.

Expanding market

In competition with chips and nuts, popcorn has recently enjoyed great success as a microwave-ovenable snack, and part of that success must be credited to metallized PET film, which is particularly well-suited to microwave use as a result of its high melting point. The popcorn packages contain a layer of metallized PET between layers of paper. In this use, known as a microwave receptor or susceptor, the metallized film in effect focuses microwave energy, thereby helping reduce the number of unpopped kernels.

Susceptor technology has also found its way into other microwavable foods including frozen fish, pizza, and waffles. This has been working so well to heat and brown these and

PIZAZZ

other products that manufacturers of metallized PET foresee a time when several levels of susceptor "focusing" will be incorporated into a single microwavable foods package, providing varying degrees of heating and browning.

Metallized polyester can be laminated to cellophane to boost the paper-based film's barriers significantly in such applications as snacks and nuts and is replacing foil and paper for products such as granola bars. Metallized PET is also in wide use for fractional pack pouches of coffee.

Demand for metallized PET is greatly exceeding supply. At this time a year ago, one manufacturer said, sales hit 1.2 million pounds. Now the figure is near 4 million and could easily go to 6 million if the required additional manufacturing capacity were onstream.

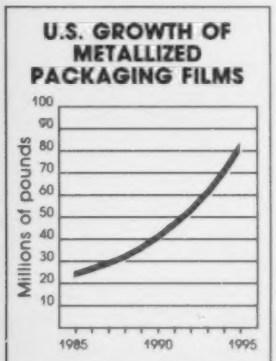
PET is not alone

It used to be that polyester was the only kind of film that could be metallized with optimal results. Recently, other types of plastic films are being successfully metallized.

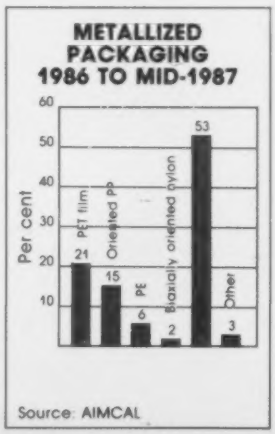
Converters are also metallizing oriented polypropylene, with excellent results. One candy manufacturer recently replaced aluminum foil with reverse-printed BOPP film laminated to metallized white opaque BOPP film for its entire line of candy bars. The manufacturer said that the foil, which had been subject to flex cracks and pinholes, allowed the bars to dry out and become stale too quickly. In addition, the creases and cracks in the foil gave the packages a manhandled sort of appearance.

Metallized nylon laminated to high-EVA polyethylene resin as a sealant is being used in bag-in-box packages for wine and concentrated soft-drink syrups. The metallizing blocks light that would otherwise harm the product before the filled bag is put in the box.

What all this means is that the market for metallized film has grown nearly fourfold in recent years and is expected to reach $80-90 million by the end of the 1980s. ■

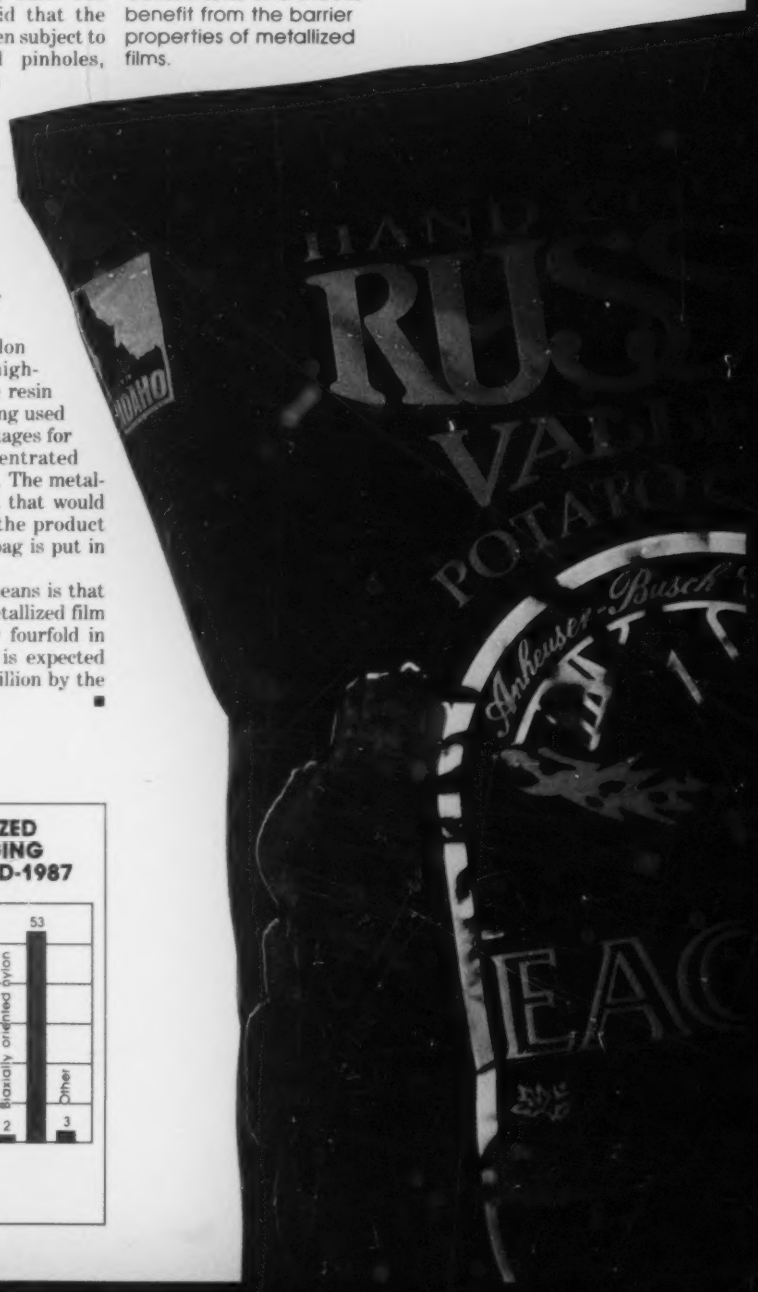


Source: Association of Industrial Metallizers, Coaters and Laminators



Source: AIMCAL

Confections and snacks benefit from the barrier properties of metallized films.



BARRIER FILMS

SATISFYING INCREASED DEMANDS

Professional smellers and tasters spur continued barrier R&D

Start with a film like cellophane, an inherently good flavor barrier. Laminate it to polyester, which stops oxygen. Metallize the PET to get an excellent barrier to ultraviolet light. In some applications, this combination of barriers would be sufficient. In others, it might not be enough. Take, for example, these:

Pouches of linament and toothpaste. Easter egg kits containing potently fruit-scented dyes. Peppermint gum packed in boxes of breakfast cereal.

End-user interest in barriers is growing dramatically. Perhaps the most striking symbol of this fact is the continuing investment by resin manufacturers in panels of organoleptics tasters and smellers. These groups investigate instances of changes in food products caused by plastic packaging.

To limit these undesirable effects, the following barrier materials are growing in popularity.

Ethylene vinyl alcohol

New investment by American companies in EVOH technology is raising domestic production of this barrier resin for use as a product-contact layer in flexible plastic packaging for such products as processed meats.

Since EVOH can be co-extruded with nylon as well as with polyolefins, another application is in bags and pouches for liquid food products.

The price of the resin is high, but EVOH is usually co-extruded with or laminated to less expensive resins, which lower the total cost of the package while protecting the barrier from moisture.

New EVOH materials are on the way. One of them maintains its high barrier at high humidity. A probable application is meats packaging —especially refrigerated meats. Another new EVOH is said to be less affected than present types by the relatively high co-extrusion temperatures of other plastic resins.

Polyvinylidene chloride

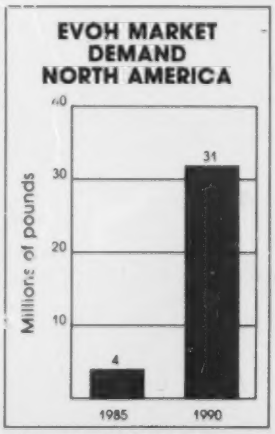
PVDC film—especially a new high-barrier variety, is also an excellent barrier to gases, water vapor, odors, aromas, and flavors. PVDC resin is also sold as a coating for other plastic films and as a resin for co-extrusions.

Among applications of PVDC film is the product-contact layer in gable-top folding cartons for orange juice. Monolayer PVDC film is also presently in wide use as in-store wrap for cheeses, meats, and other deli items.

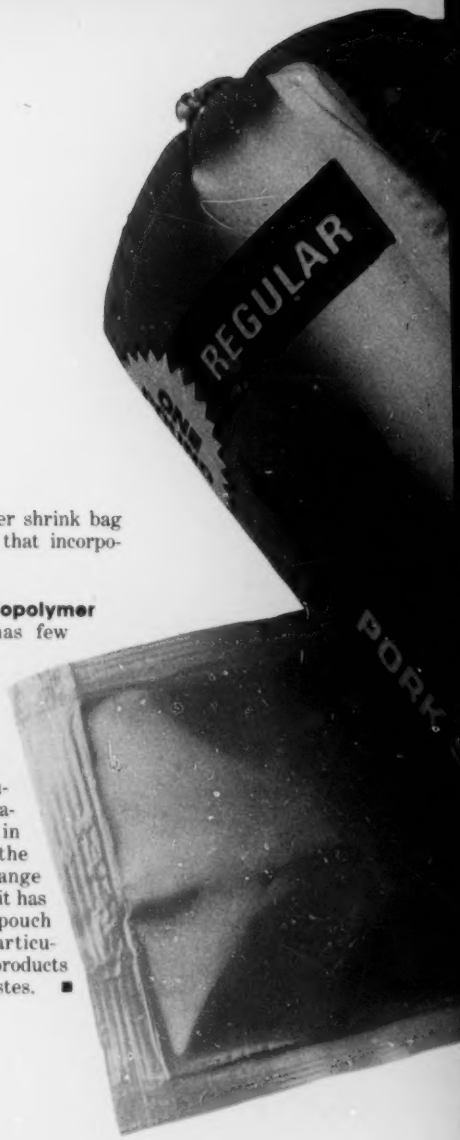
A high-barrier variety of PVDC film is also used in medical applications such as bags of intravenous solutions. And at least one converter is making a barrier shrink bag for fresh meat that incorporates PVDC.

Acrylonitrile copolymer

This resin has few flexible-packaging applications at present. Its nonscalping barrier properties make it valuable as an alternative to PET in packages like the composite orange juice can. Also, it has been used in pouch packages of particularly aromatic products such as toothpastes. ■



Source: Industry estimates



Protecting flavors and aromas are barrier resins in film packages of sausage and banana puree.

PACKAGING

THE CAHNERS MAGAZINE FOR DECISION MAKERS JANUARY 1988

Packaging Efficiency Soars 60% at Gillette

1988 Outlook

Oxygen Absorbers Preserve Food

Flashy Packages Sell Snacks

Inspection Made Easy

Here Comes a New Polyethylene

CONTENTS

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A CAHNERS PUBLICATION VOLUME 33 NUMBER 1

PACKAGING NEWS

Oxygen absorbers keep food fresher 8
Iron-oxide packets maintain product freshness through oxygen absorption in controlled-atmosphere packaging

Self-chilling sake can debuts in Japan 12

New Wave graphics promote Maybelline mascara 13

Custom can hails Log Cabin's 100th anniversary 14

Tamper-evident PET jar bows for Plochman's mustard 14

Statistics: Food labels rate "fair" in accuracy 37

PACKAGING FEATURES

SPECIAL REPORT

Container prices, shipments up sharply in 1988 42
Suppliers to raise prices in response to stronger exports and the weaker dollar

PACKAGING OPERATIONS

Plant of the Month: Gillette: Efficiency up, rejects down 50
When Gillette convinced line crews of its commitment to improvement, their response triggered the gains

MARKETING

Flashy packages reflect new consumer tastes 58
As the market flourishes, snack-makers innovate to protect the flavor and crunch

STATE OF THE ART

On-line inspection offers simpler choices 68
Software systems make inroads in packaging, but some tasks move faster with simple sensing

PACKAGING TECHNOLOGY

New package for microwave ovens 75
A low-density, foamable blend provides substantial heat performance over traditional polystyrene

Stronger, tougher polyethylene 79
New family of ultra low-density polyethylene has greater resistance to punctures and tears

Thermal-transfer printer turns out UPC codes at 120 per minute 92

Strobe lights check print accuracy at 2,000 feet per minute 93

Combination net weigher pays for itself in less than a year 94

Carton-forming speed doubles with instant hot-melt adhesive 99

Matrix kit helps select the right box—at the right price 100

DEPARTMENTS

EDITORIAL	3	NEW EQUIPMENT	86	ADVERTISERS INDEX	108
PEOPLE	16	NEW MATERIALS	95	WRAP UP	108
ASSOCIATION NEWS	30	CLASSIFIED	101	READER SERVICE CARD	109

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LABEL PHOTOS RATED 'FAIR' IN ACCURACY

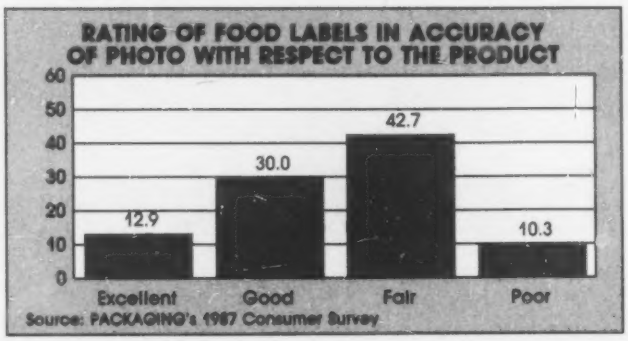
Few consumers called food pictures "poor"

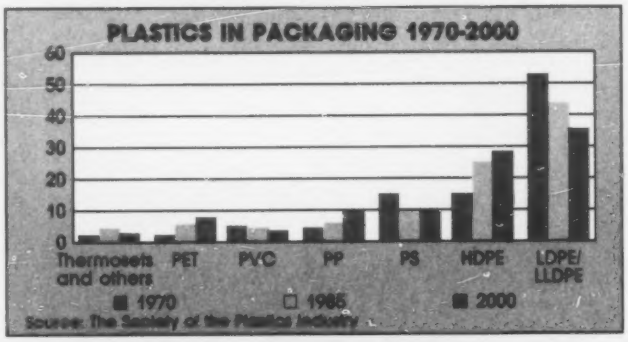
Consumers responding to a recent PACKAGING magazine survey reported that they believed photographs on food product labels to be generally accurate.

Asked to judge label photos in terms of accurate representation of the products inside the packages, 42.7 per cent of the respondents gave them a "fair" rating and 30.0 per cent called them "good."

Label accuracy received an "excellent" rating from 12.9 per cent of the respondents; almost as high a percentage of them rated the photographic representations "poor."

The survey, conducted by PACKAGING and NFO Research, obtained 721 responses out of a total 1,000 consumer households contacted.





ROLE OF PLASTIC SEEN GROWING STEADILY

Shift from other materials is the key

A new study released by the Society of the Plastics Industry, Washington, D.C., reported an annual growth rate of nearly 4 per cent for plastic packaging materials between now and the year 2000.

The study said this will happen despite low population growth, which could be expected to limit the market for packaging materials in general. A drive toward ever-greater convenience and the resulting replacement of traditional packaging materials with plastics will offset the demographic factors.

Not all plastics will share equally in the growing market. The percentages of polyester (PET), polypropylene (PP), and high-density polyethylene (HDPE) will increase according to the study, but those of polyvinyl chloride (PVC) and low-density and linear low-density polyethylenes (LDPE and LLDPE) will drop.

By the turn of the century, said the SPI, plastics will account for over 40 per cent of food packaging materials in the United States—up from 20 per cent in 1985.

For more information about the SPI study, write to the Society of the Plastics Industry, 1275 K. St. NW, Suite 400, Washington, D.C. 20005.

PACKAGING LEADTIMES (in weeks)

	Nov. '87	Oct. '87	Nov. '86
Metal cans	2.5	2.5	2.9
Composite cans	2.6	2.9	3.3
Glass containers	3.6	4.6	5.0
Plastic bottles	2.7	4.1	3.7
Plastic film	3.2	4.2	3.6
Laminates	3.8	5.6	4.3
Corrugated containers	2.7	2.8	2.8
Multiwall bags	3.8	3.4	3.4
Kraft paper	3.0	2.8	3.2
Folding cartons	3.9	4.0	3.9
Fiber drums	2.5	2.7	2.9
Industrial crates	2.6	2.7	2.9
Strapping	2.5	2.6	2.6
Steel drums (shipping)	2.6	2.5	2.7
Pallets	2.8	2.8	2.8

Source: Purchasing, a Cahners Publication

TRANSACTION PRICES ($/lb.)

	Nov. '87	Oct. '87	Nov. '86
Aluminum can stock ($/lb.)	1.08	1.08	1.08
LDPE/liner($/lb.)	.40	.38	.27
LDPE/clarity($/lb.)	.41	.39	.31
LLDPE/butene($/lb.)	.38	.39	.27
LLDPE/octene($/lb.)	.48	.49	.34
HDPE/blow molding($/lb.)	.41	.41	.32
HDPE/film grade($/lb.)	.42	.42	.35
Polystyrene/general purpose($/lb.)	.54	.54	.34
Polystyrene/impact($/lb.)	.58	.58	.35
PVC/general purpose($/lb.)	.40	.40	.30
PP/homopolymer($/lb.)	.45	.46	.35
PP/copolymer($/lb.)	.55	.56	.46
ABS($/lb.)	1.07	1.07	.98
Unbleached kraft/shipping sack($/ton)	460	460	430
Unbleached kraft/grocery sack($/ton)	430	430	375
Linerboard, 42 lb., east($/ton)	380	380	320
Linerboard, 42 lb., west($/ton)	380	380	320
Corrugated med., semichemical($/ton)	350	350	300
Recycled folding boxboard, clay coated($/ton)	410	410	390
Recycled folding boxbd., chipbd.($/ton)	320	330	300
Bleached kraft, folding carton($/ton)	625	625	610

Source: Purchasing, a Cahners publication

MAKERS OF PACKAGING MACHINES ADOPT CAD

Computers help keep companies competitive

Packaging machinery manufacturers in the United States are increasingly adopting computer-aided design (CAD) systems to help them improve designs and raise productivity, according to a survey by the Packaging Machinery Manufacturers Institute, Washington, D.C.

The survey revealed that 46 per cent of PMMI's member companies now use CAD systems and 72 per cent of those companies not presently using CAD systems intend to acquire them within the next two years.

Primary uses of the systems are in making drawings and layouts of mechanical, electrical, and electronic equipment.

CORRUGATED GROUP REPORTS JUMP IN SALES

Converters also see rise in shipments

Independent corrugated converters reported an average increase in dollar sales of more than 17 per cent for the first half of 1987 compared with last year, according to the Association of Independent Corrugated Converters, Alexandria, Va.

During the same period, said the AICC, the companies responding to the survey reported an average 11.7 per cent increase in square footage shipped.

Of the association's 500 box-making members, 168 responded to the survey.

For more information about the AICC's Quarterly Business Conditions Survey, write the AICC at 801 N. Fairfax St., Alexandria, Va. 22314.

MORE STATS . . .

According to Cahners Economics, Newton, Mass., **consumer spending for alcohol** purchased with meals and beverages hit a seasonally adjusted level of $24.2 billion in the first half of 1987. That represents a real increase of 2.8 per cent over the same period of 1986 . . . Of all readers of PACKAGING who responded to the magazine's 1987 Salary Survey, 66 per cent agreed with the following statement: "Problems concerning **the recyclability of plastics** will adversely affect the plastic container's competitive future." The full 1987 Salary Survey is contained in the Nov. issue.

CONTAINER PRICES, SHIPMENTS UP SHARPLY IN 1988

Surging exports and a weaker dollar have allowed container suppliers to raise prices. Shipments of paperboard and plastic containers will also increase this year—metal and glass are harder to call

By Melissa Larson
Senior Editor

The good economic news for buyers of packaging is over in 1988—suppliers of materials and finished containers are raising prices in response to stronger exports, a weaker dollar, and production running at or near capacity in many facilities.

Shipments will be up sharply for paperboard and plastic containers in 1988. Metal can shipments will depend upon the rise in raw material prices, and how much of these increases can makers will be able to absorb.

Glass shipments will finish flat in 1987 and resume a gentle downward trend in 1988—apparently the only exception to the general upward trend. Glass container prices may be up only 1 or 2 per cent in 1988, depending in part on pending merger activity among glass container giants.

These are the predictions of several private economic forecasting firms, including Cahners Economics, which have been carefully tracking packaging materials and finished containers. They also reflect the views of Wall Street analysts and other industry observers. Although views vary on just how much prices and shipments will increase, there is not much doubt that the trends are up.

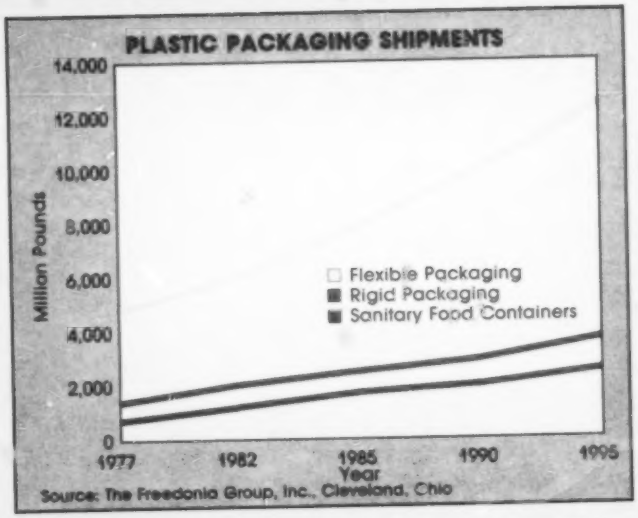
Recent stock market volatility, changes in the value of the dollar against foreign currencies, and export levels for packaging could all play a role in determining how closely 1988 container prices and shipments conform to these predictions.

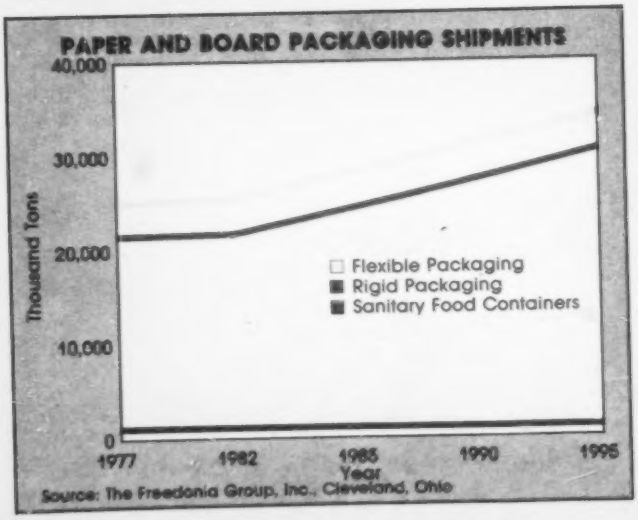
Producer price index

Price information received from Wharton Econometrics Forecasting Associates, and presented here in chart format, is based on the Producer Price Index for selected packaging materials.

Kept by the U.S. Bureau of Statistics, the Producer Price Indexes "measure average changes in prices received in primary markets of the U.S. by producers of commodities in all stages of processing," according to the Bureau.

Data for 1984 through the





METAL CAN SHIPMENTS 1982-1986 (million cans)

	1982	1983	1984	1985	1986	% Change '85-'86
Total Metal Cans Shipped	89,321R	92,394	97,781	101,399R	104,913	+3.0
By Market						
For Sale	59,375R	61,907	66,405	69,810	75,509	+8.2
Beverage	42,726	45,167	48,719	52,017	57,265	+10.1
Food	13,048R	12,914	13,739	13,974	14,227	+1.8
General Packaging	3,601	3,826	3,947	3,819	4,017	+5.2
For Own Use	29,946	30,487	31,376	32,089R	29,404	−8.4
Beverage	15,208	16,289	16,925	18,160	15,637	−13.9
Food	14,579	14,027	14,374	13,870R	13,701	−1.2
General Packaging	159	171	77	59	66	+11.9
By Product						
Beverage	57,934	61,486	65,644	70,177	72,902	+3.9
Beer	31,729	33,135	34,354	35,614	36,058	+1.2
Soft drinks	26,205	28,321	31,290	34,563	36,844	+5.6
Food	27,627R	26,941	28,113	27,844R	27,928	+0.3
Baby Foods	895	902	915	936	956	+2.1
Coffee	653	632	644	615	553	−10.1
Dairy Products	889	927	974	1,246	1,203	−3.5
Fruit, Fruit Juices	3,768	3,651	3,389	3,046R	2,783	−8.6
Meat & Poultry	1,411	1,492	1,508	1,492R	1,447	−3.0
Pet Foods	3,593	3,571	4,020	4,069	4,488	+10.3
Seafoods	1,341R	1,527	1,607	1,881	1,914	+1.8
Shortening	246	247	186	109	55	−49.5
Vegetables, Veg. Juices	9,087	8,303	8,702	8,339R	8,544	+2.5
Other Foods, Including Soup	5,734	5,689	6,168	6,111	5,985	−2.1
General Packaging	3,760	3,997	4,024	3,878	4,083	+5.3
Aerosol	1,970	2,144	2,223	2,277	2,530	+11.1
Paint & Varnish	795	817	840	830	816	−1.7
Automotive Products	257	229	199	166	133	−20.8
Other Nonfoods	738	807	762	603	604	+0.2
By Material Used						
Steel	36,393R	34,316	34,654	34,559R	34,302	−0.7
Aluminum	52,928	58,078	63,127	67,340	70,611	+4.9
Weight Of Aluminum Cans Shipped						
(Thousands of lbs.)	2,809,951	3,168,123	3,562,327	3,560,704	3,730,291	+4.8

R=Revision

Producer price indexes are up for most packaging commodities

present are featured, with Wharton's forecast for the remainder of 1987 and 1988. The index line on the chart tracks the price movement of the commodity from the base level of 100, which represents the average price level for the 'base" year indicated.

The indexes are valuable because they consistently measure price movements, are tracked by the U.S. government, based on actual transaction prices wherever possible, and are corrected for inflation. They're also significant because many long-term purchase contracts for these commodities are keyed to the Producer Price Index, according to Frantz Price, director of strategic industry analysis for Wharton Econometrics.

Also of interest to purchasers of packaging materials is the following actual transaction forecast price data from Cahners Economics. The service's predictions include a forecast of 43 cents per pound for LDPE liner by the 4th quarter of 1988, up sharply over 38 cents per pound for the 4th quarter of 1987.

Aluminum can stock will hit $1.15 per pound by the end of 1988, according to Cahners. Another prediction is that kraft linerboard prices, which soared in 1987, will remain as high as $385 per ton in 1988.

"Prices are rising, basically, because there is rising demand in all four packaging categories," stated Price, in explaining Wharton's basis for its 1987-1988 predictions. "There is a surge in exports, tied to the lower value of the dollar against foreign currency, which means that packaging producers are less dependent on domestic sales. They may also be trying to recoup past losses."

Glass containers

Price commented that operating rates will improve for glass container manufacturers as excess capacity is cut—a trend which may continue into 1988.

In fact, there was an uptick in glass container shipments for 1986, reflecting new popularity for glass food containers and a perceived "bottoming out" of the drop in demand for glass beer bottles—the bellweather of glass container usage.

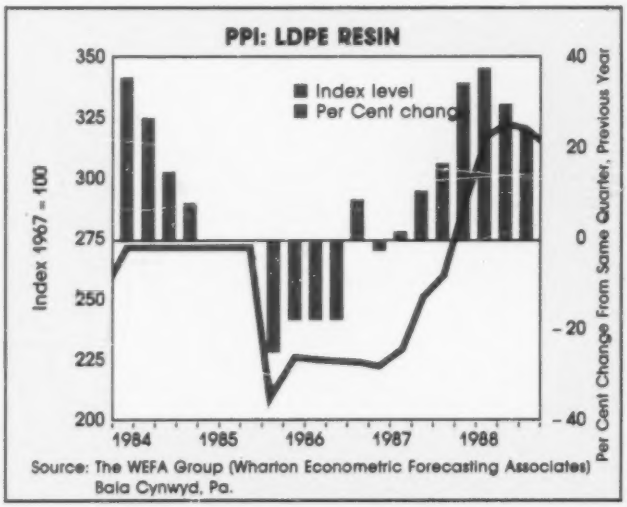
HOW TO READ THESE CHARTS

These commodity price tables, using the U.S. government's Producer Price Index, should be read in the following way: the curving line represents the index itself, and corresponds to the index numbers on the left side of the table. The "index year" is the base line in terms of price for that particular commodity. For example, the index year for corrugated shipping containers (chart below) is 1967—which represents a base level of 100. Between 1967 and 1984, the first year of the chart, the PPI rose from 100 to 250. Remember that the PPI tracks price *movements*, not actual dollars and cents. The series of bars refers to the percentages listed on the right side of the table, and represent the per cent increase or decrease in the PPI *from the same quarter of the previous year*. There are four quarters shown per year, or four bars. A five-year price trend for each commodity is presented, with the 4th quarter of 1987 and all of 1988 representing Wharton's forecasts.

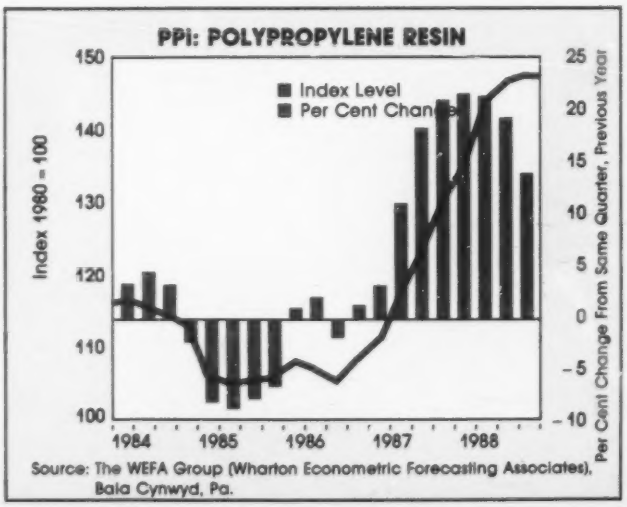
GLASS SHIPMENTS (Thousands of Gross)

Type of Container	1986	1985	1984	1983	1982
Narrow Neck					
Food	27,737P	23,770	26,170	28,270	27,658
Medicinal and health supplies	15,907P	8,710	10,140	9,665	12,393
Chemical, household, and industrial		942	1,379	976	1,456
Toiletries and cosmetics		5,302	6,566	6,506	8,006
Beverage, refillable	62,093	1,553	2,100	3,383	3,729
Beverage, nonrefillable		58,532	59,475	59,234	57,291
Beer, refillable	87,601	1,870	3,473	2,475	1,899
Beer, nonrefillable		81,907	87,323	94,625	105,962
Liquor	10,873	11,939	14,015	14,712	13,757
Wine	17,157	14,036	10,414	8,916	8,408
TOTAL NARROW NECK	221,368	208,561	221,055	228,762	240,559
Wide Mouth					
Food	60,044	59,935	64,302	60,108	63,372
Medicinal and health	4,830P	2,715	3,150	2,995	3,097
Chemical, household, and industrial		1,015	988	812	1,159
Toiletries and cosmetics		595	455	426	659
TOTAL WIDE MOUTH	64,874	64,260	68,895	64,341	68,287
TOTAL (NARROW & WIDE MOUTH)	286,242	272,821	289,950	293,103	308,846

Source: U.S. Dept. of Commerce P = PACKAGING Estimates



Source: The WEFA Group (Wharton Econometric Forecasting Associates) Bala Cynwyd, Pa.



Source: The WEFA Group (Wharton Econometric Forecasting Associates), Bala Cynwyd, Pa.

The Glass Packaging Institute reports a 1.6 per cent increase in glass container shipments through the first three quarters of 1987. However, other observers feel that 1986 was an aberration, that 1987 will wind up flat, and that glass shipments are likely to decline slightly in 1988.

Glass container price forecasts are in the 3-4 per cent range, although some Wall Street analysts have scaled back to a 1-2 per cent increase. They say the Owens-Illinois/Brockway deal, and its effect on glass manufacturing costs, may have an impact on glass price increases.

Metal cans

It's no secret that aluminum prices have been up sharply, but thus far aluminum can manufacturers have largely avoided passing along these increases to finished containers. The year1988 will probably see an increase, however—estimates ranges from 4 to 7 per cent.

Steel can prices are headed up also, according to Wharton's data. Shipments for metal cans in general will depend on continued inroads into beverage packaging, and on new food container applications for both steel and aluminum.

Paper and board

Paperboard packaging capacity will soon be straining 99 per cent if the dollar continues to fall. Competition between plastic and paperboard packaging has resulted in increased growth for both types of packaging. Surging pulp prices are also having an effect.

Prices for linerboard, corrugated containers, and even coated paper label stock will be up in 1988, according to Wharton Econometrics, while Cahners Economics advises observers to watch order lead times closely.

Plastic containers

Full-out production, and its affect on resin prices, is the story here. Virtually every major packaging resin will experience healthy price increases in 1988, and the reason is simple, according to Wharton's Price. "Plastics are operating at full capacity," he stated.

Meanwhile, a recent study by the Freedonia Group, Cleveland, Ohio estimates that plastics demand will grow 5 per cent annually through 1990. In the same report, the group predicts rising shipment rates for virtually all flexible and rigid plastic packaging. ■

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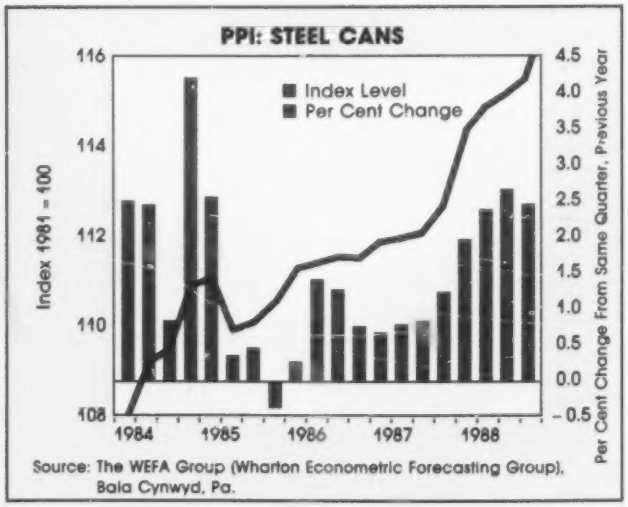
Outstanding	480
Above average	481
Average	482
Below average	483

MELISSA LARSON
Senior Editor
"The price jumps headed our way appear to be based in solid economic realities— a falling dollar vs. foreign currencies, making U.S. packaging commodities more attractive abroad, and leading to tighter supplies for these goods here at home."



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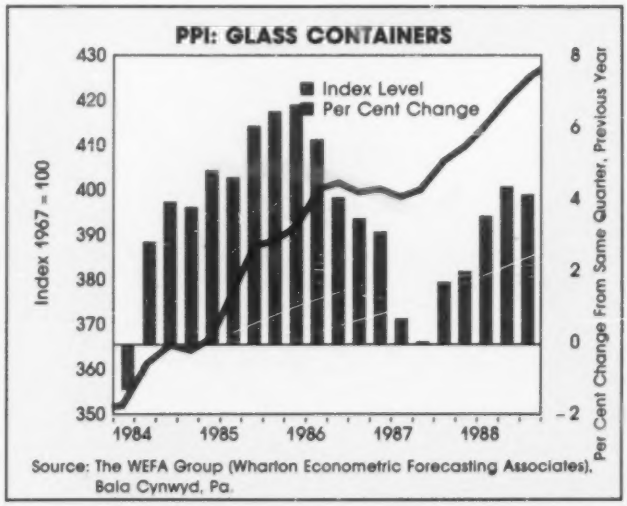

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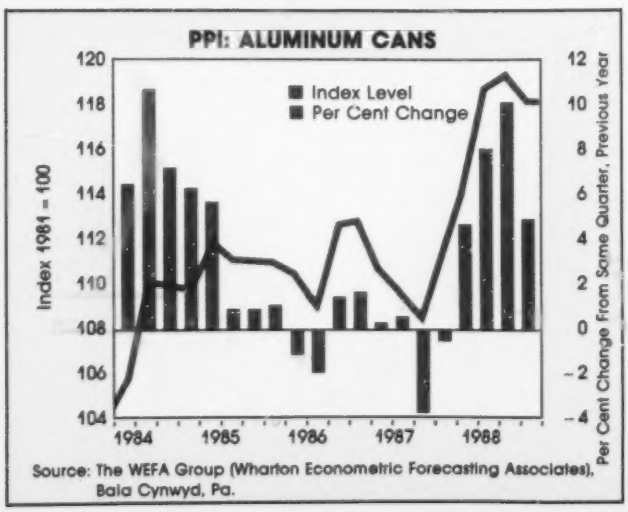

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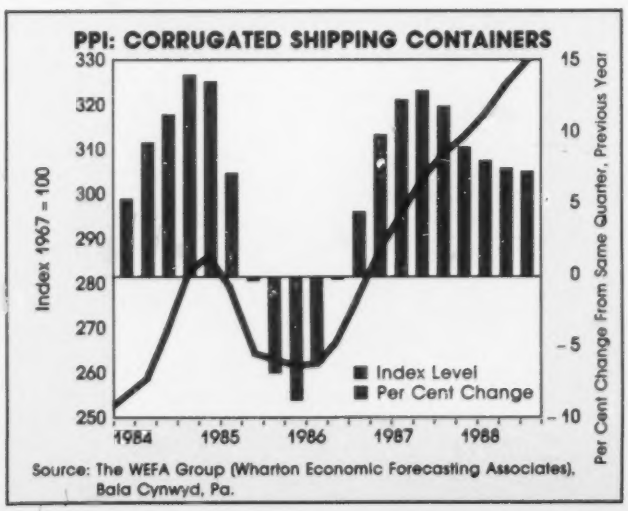

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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION MAKERS/FEBRUARY 1988

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Computers Design Packages

EastPack Show Preview

Drug Firms Cut Downtime

New Labeler Hits 1000/Min

Line Built For Zero Defects

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CONTENTS

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A CAHNERS PUBLICATION VOLUME 33 NUMBER 3

PACKAGING NEWS

Computers design packages 8
New computers let graphic artists create and alter package concepts in a flash

GE's dispenser provides precise sealant flow 12

Riviana Foods scores with unique rice package 13

Orange juice wars: Big bottle battle is on 14

Statistics: Consumers seek easy-to-open packages 33

PACKAGING FEATURES

SPECIAL REPORT

Drug firms cut downtime 38
Drug packagers report fewer rejects and improved quality for materials and containers

EastPack '88 Show Preview 78
With more than 200 exhibitors, the year's first major packaging expo opens March 1st

PACKAGING OPERATIONS

Plant of the Month: Line built for zero-defects 46
Calsonic targets every case to leave its plant complete, with nothing missing from the contents

Kahlua toasts labeler—productivity up 33% 73
Increased productivity and improved quality were goals met with rugged, high-speed system

STATE OF THE ART

Corrugated looks great! 58
Retailers and packagers reap marketing benefits from new corrugated technology

PACKAGING OPERATIONS

Ink Jet Printer codes 300 items 67

Salad dressing firm installs computerized system to print information on filled corrugated cases

PACKAGING TECHNOLOGY

Labeler hits 1,000 per minute 91
Pressure-sensitive labeling now has double the accuracy to ±1/64-inch

Remington shaver a clear winner in RF-sealed, clamshell blister 110

Pepsi plant ends bottlenecks with stapled belt fasteners 112

Saran gets recycled, cuts container costs 5-10% 121

Carded blister packaging ends damaged returns 122

DEPARTMENTS

EDITORIAL	3	NEW EQUIPMENT	94	ADVERTISERS INDEX	129
PEOPLE	16	NEW MATERIALS	113	WRAP UP	130
ASSOCIATION NEWS	27	CLASSIFIED	123	READER SERVICE CARD	131

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CONSUMERS SEEK EASY-OPEN PACKAGES

Convenience affects product decisions

Consumers in each of four age groups surveyed in 1987 by PACKAGING magazine reported that they look for package-opening convenience when considering a food product purchase.

In all groups, more consumers called this package characteristic "extremely important" than either "somewhat important" or "not very/not at all important."

The percentage of consumer respondents in the "extremely important" category rose with age, from less than half of those under 25 to nearly three-quarters of those 65 and over.

The consumer survey questionnaire was sent to 1,000 households. Of that number, 721 consumers responded with their opinions on a wide range of packaging-related issues and trends.

BUYING OF FOOD AWAY FROM HOME RISES

Demographics alter growth of foodservice

The U.S. Bureau of Labor Statistics, in its recently released 1985 Consumer Expenditure Diary Survey, reported that weekly spending on food away from home has risen.

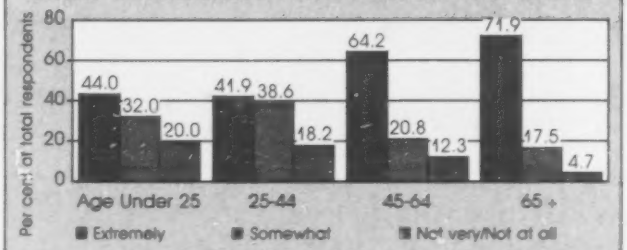
Expenditures increased from $15.77 per household in 1980-81 to $21.32 in 1985.

Not all segments of the foodservice industry can be expected to grow equally in the future, according to Cahners Economics, Newton, Mass. Fast-food restaurants might see a drop in customers over the next decade or so while family-style restaurants experience a slight boom.

One reason is that the number of 18-24 year olds—big patrons of fast-food—has declined about 10 per cent since 1980. A second reason is that the number of people in this age group living with parents—and eating at home—increased from 48.4 per cent in 1980 to 52.6 per cent in 1986.

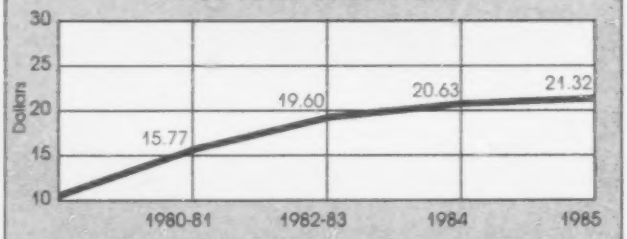
Thirdly, since those born in the peak Baby Boom years are now turning 30 and the oldest of the Baby Boomers are already 40, the number of married couples has increased. Cahners said married couples made up 12 per cent of new households formed in 1983-84, 35 per cent in 1985, and 60 per cent in 1986. That may prove to be good news for family-style and moderately priced full-service restaurants.

IMPORTANCE OF 'CONVENIENT TO OPEN' WHEN CONSIDERING FOOD PRODUCT PURCHASE



Source: Packaging's 1987 Consumer Survey

WEEKLY SPENDING ON FOOD AWAY FROM HOME



Source: Bureau of Labor Statistics

PACKAGING LEADTIMES (In weeks)

	Avg.	Dec. '87	Dec. '86
Metal cans	2.8	2.8	3.4
Composite cans	2.8	2.6	3.2
Glass containers	3.9	3.6	4.3
Plastic bottles	3.0	2.7	3.9
Plastic film	3.8	3.2	3.5
Laminates	4.3	3.8	5.4
Corrugated containers	2.7	2.7	2.9
Multiwall bags	3.8	3.8	3.7
Kraft paper	3.0	3.0	3.0
Folding cartons	3.6	3.9	4.0
Fiber drums	2.6	2.5	3.5
Industrial crates	2.6	2.6	3.3
Strapping	2.5	2.5	2.7
Steel drums (shipping)	2.6	2.6	2.8
Pallets	2.6	2.5	2.7

Source: Purchasing, a Cahners Publication

TRANSACTION PRICES

	Dec. '87	Nov. '87	Dec. '86
Aluminum can stock ($/lb.)	1.03	1.03	1.06
LDPE/liner($/lb.)	.38	.38	.29
LDPE/clarity($/lb.)	.39	.39	.33
LLDPE/butene($/lb.)	.39	.39	.27
LLDPE/octene($/lb.)	.49	.49	.35
HDPE/blow molding($/lb.)	.41	.41	.33
HDPE/film grade($/lb.)	.42	.42	.35
Polystyrene/general purpose($/lb.)	.58	.54	.34
Polystyrene/impact($/lb.)	.61	.58	.35
PVC/general purpose($/lb.)	.40	.40	.31
PP/homopolymer($/lb.)	.46	.46	.35
PP/copolymer($/lb.)	.56	.56	.45
ABS($/lb.)	1.14	1.07	.99
Unbleached kraft/shipping sack($/ton)	480	480	430
Unbleached kraft/grocery sack($/ton)	430	430	375
Linerboard, 42 lb., east($/ton)	360	360	320
Linerboard, 42 lb., west($/ton)	360	380	320
Corrugated med., semichemical($/ton)	350	350	300
Recycled folding boxboard, clay coated($/ton)	410	410	390
Recycled folding boxbd., chipbd.($/ton)	330	330	300
Bleached kraft, folding carton($/ton)	625	625	610

Source: Purchasing, a Cahners publication

PACKAGING PAY DIFFERS REGIONALLY

North Central leads in earners of $50,000

Regional demographic data generated by PACKAGING's 1987 salary survey indicate that, of those respondents making over $50,000 a year, almost 32 per cent live in the North Central region of the United States. Another 24 per cent of them live in the Northeast. The South and West each are home to 22 per cent of those in that income bracket.

The North Central region also ranks first in seniority, with 31 per cent of respondents having over 20 years on the job. Another 25 per cent of those with over 20 years' seniority live in the South. Northeast and Western regions are tied for third—each having 22 per cent.

Also from the survey: The average respondent has been on his or her present job 8.6 years; 22 per cent of all respondents have been on the job less than three years; and 10 percent of them have over 20 years' seniority.

MORE STATS . . .

The Italian Trade Commission, Chicago, reported that the **Italian packaging machinery** industry now holds a 25 per cent share of total U.S. imports in this field. This places Italy second only to West Germany, which has a 29 per cent share . . . According to a major player in the market, **shipments of aluminum cans** for beer were expected to total 37 billion units in 1987. Shipments of aluminum cans for all beverages reached 69 billion units in 1986 and were seen increasing to 72 billion units last year . . . The Society of the Plastics Industry, Washington, D.C., announced that **production of plastic resins** for the first seven months of 1987 totaled 27.8 billion pounds—a 9.4 per cent increase over the same period in 1986 . . . The American Paper Institute, New York City, pegged manufacturing capacity for **primary paper and paperboard** in U.S. mills at roughly 78 million pounds in 1987. This represents an increase of 3 per cent over 1986, the highest single-year gain in the past 14 years . . . Consumption of **polymer blends and alloys** will exceed 800 million pounds in 1992, reported Kline & Co., Fairfield, N.J. This level of consumption represents an annual growth rate of 8 per cent.

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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/MARCH 1988

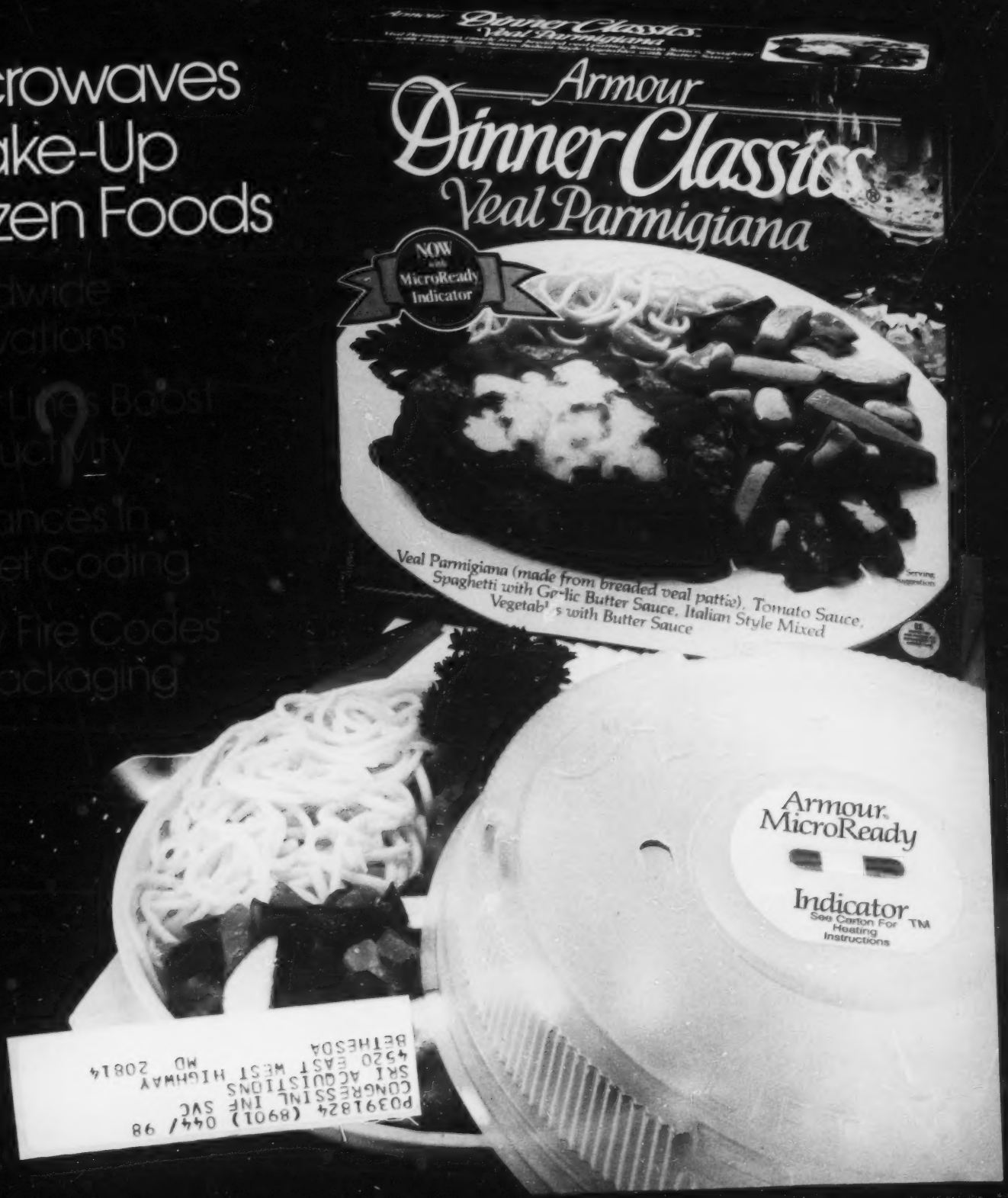
Microwaves Shake-Up Frozen Foods

Worldwide Innovations

New Lines Boost Productivity

Advances In Ink-Jet Coding

New Fire Codes Hit Packaging



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CONTENTS

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A CAHNERS PUBLICATION VOLUME 33 NUMBER 4

PACKAGING NEWS

New fire codes hit packaging 8
Important changes are due for flammables packed in plastic under new regulations

Easy-flow bottle announced for all Quaker State motor oils 12

So Fine shampoo debuts in non-aerosol container 13

Clamshell clicks for household fire extinguisher 14

Statistics: Barrier container use to expand through 1990 33

PACKAGING FEATURES

MARKETING

Microwaves shake-up frozen foods 38
Demand for convenience at low cost keeps packagers scrambling to innovate

Packaging innovators win awards 79
Food-industry developments are recognized for helping to expand the use of plastics

PACKAGING OPERATIONS

Plant of the Month: New lines boost productivity 46
Line advances toward tomorrow's goal of computer-integrated manufacturing

Special packaging reduces fire risk 72
Digital Equipment Corp. switches to fire-retardant materials

SPECIAL REPORT

Worldwide innovations 56
New developments in Taiwan, Holland, France and Sweden pace packaging's global gains

STATE OF THE ART

Advances in ink-jet coding technology 64
The speed and flexibility of ink jets makes them the "star" of character imprinting

PACKAGING TECHNOLOGY

New approach for foil lids 85
Tamper-evidence and consumer safety are two benefits of a new European closure system

Twin bar-coder imprints both ends of boxes at 70 per minute 102

Case erector-sealer turns out 30,000 per day for Johnson Wax 104

Anvilbox trays give strength without added partitions 114

DEPARTMENTS

EDITORIAL	3	NEW EQUIPMENT	88	ADVERTISERS INDEX	122
PEOPLE	28	NEW MATERIALS	107	WRAP UP	122
ASSOCIATION NEWS	32	CLASSIFIED	115	READER SERVICE CARD	123

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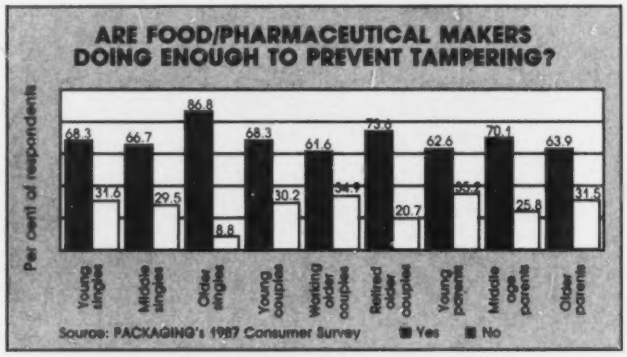
ANTI-TAMPERING MOVES GET HIGH MARKS

Consumers say packagers are "doing enough"

By a ratio of nearly 5 to 2, consumers who responded to PACKAGING's 1987 Consumer Survey said they believed manufacturers of foods and pharmaceuticals were protecting consumers sufficiently from tampered products.

Of the 721 respondents, 495 said the manufacturers were doing enough in this regard with packaging.

The largest percentage of favorable responses and lowest percentage of unfavorable responses came from consumers in the "older singles" group. The lowest percentage of favorable responses came from those in the "working older couples" category.



BARRIER CONTAINER USE KEEPS GROWING

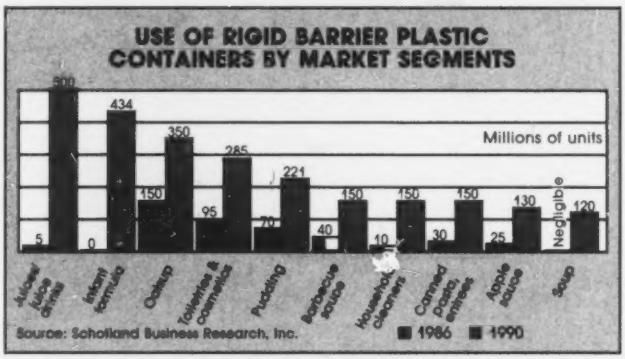
Group sees expansion lasting through 1990

A recently published report from Schotland Business Research, Princeton, N.J., predicted continued growth in the use of rigid barrier plastics packaging during the coming three years.

The study highlighted 10 product categories, each of which was expected to utilize more than 100 million rigid barrier plastic containers by 1990. According to the researchers, products in these categories totaled 425 million units in 1986 and will grow by a factor of six to 2.5 billion units through 1990.

Most dramatic of all the growth predictions was that for juices and juice drinks. Use of barrier containers in this category was shown shooting from 5 million units to a hundred times that many. Nearly as rapid a rate of growth was foreseen for infant formula—from zero to 434 units.

Also according to the report, use of rigid barrier containers for catsup will more than double, that for toiletries and cosmetics as well as for pudding will triple, and that for soup will increase from a negligible number of units to 120 million.



HIGH-PERFORMANCE FILM USE TO GROW

Sales to reach $2.2 billion by 1992

The next four years will see significant growth in the use of high-performance packaging films, according to a study from Kline & Co., Fairfield, N.J.

EVOH barrier resin will show the strongest increase, the study said, growing at 8 per cent each year to 3.1 million pounds in 1992.

PVDC also will maintain a strong position as the barrier resin used in most major food areas. Its use will grow from 20 million pounds in 1987 to more than 25 million pounds in 1992. Growth of PVDC films, used chiefly in packaging fresh red meats, is expected to be static.

The study also said sales of metallized films will increase at 12 per cent per year from $85 million in 1987 to nearly $150 million in 1992. Among the markets accounting for this growth are snack foods, institutional coffee, bag-in-box applications, and microwave susceptors.

PACKAGING LEADTIMES (in weeks)

	Jan. '88	Dec. '87	Jan. '87
Metal cans	3.2	2.8	3.7
Composite cans	2.9	2.8	3.3
Glass containers	2.8	3.9	4.7
Plastic bottles	3.0	3.0	3.2
Plastic film	3.9	3.8	3.5
Laminates	5.0	4.3	5.3
Corrugated containers	2.6	2.7	2.9
Multiwall bags	3.4	3.8	4.3
Kraft paper	2.8	3.0	3.2
Folding cartons	3.8	3.6	3.9
Fiber drums	2.5	2.6	2.9
Industrial crates	2.5	2.6	2.8
Strapping	2.5	2.5	2.7
Steel drums (shipping)	2.7	2.6	3.5
Pallets	2.6	2.6	2.5

Source: Purchasing, a Cahners Publication

TRANSACTION PRICES

	Jan. '88	Dec. '87	Jan. '87
Aluminum can stock ($/lb.)	1.03	1.03	1.07
LDPE/liner($/lb.)	.43	.38	.28
LDPE/clarity($/lb.)	.44	.39	.32
LLDPE/butene($/lb.)	.43	.39	.28
LLDPE/octene($/lb.)	.53	.49	.32
HDPE/blow molding($/lb.)	.46	.41	.34
HDPE/film grade($/lb.)	.47	.42	.35
Polystyrene/general purpose($/lb.)	.56	.58	.36
Polystyrene/impact($/lb.)	.61	.61	.37
PVC/general purpose($/lb.)	.41	.40	.31
PP/homopolymer($/lb.)	.49	.46	.36
PP/copolymer($/lb.)	.59	.56	.46
ABS($/lb.)	1.14	1.14	.98
Unbleached kraft/shipping sack($/ton)	480	480	430
Unbleached kraft/grocery sack($/ton)	430	430	375
Linerboard, 42 lb., east($/ton)	380	330	350
Linerboard, 42 lb., west($/ton)	380	380	360
Corrugated med., semichemical($/ton)	350	350	320
Recycled folding boxboard, clay coated($/ton)	410	410	400
Recycled folding boxbd., chipbd.($/ton)	330	330	320
Bleached kraft, folding carton($/ton)	625	625	600

Source: Purchasing, a Cahners publication

EAT-IN, EAT-OUT FOOD COSTS DIVERGE

Inflation to create a home-meal advantage

Cahners Economics, Newton, Mass., reported recently that consumer prices of food eaten away from home rose 4.0 per cent in 1987 and the price of food eaten at home rose by 4.4 per cent. During the same period, overall consumer prices rose 3.7 per cent.

In 1988, Cahners said, the inflation rate for food eaten away from home will be 4.2 per cent and that for food eaten at home will be 3.3 per cent.

Moreover, according to Cahners, the inflation rate for food at home is likely to decline again in 1989 while the price of food eaten away from home rises further.

DEMAND FOR PE, PP TO RISE THROUGH 1992

New capacity expected to barely keep pace

According to a recent forecast by the USI division of Quantum Chemical Corp., Cincinnati, market demand for polyethylenes and polypropylene is likely to increase by as much as 5 per cent over the next five years. USI expects 1988-1992 market growth to fall slightly from the rapid expansion rates of 1987: 8.4 per cent for LDPE/LLDPE, 16.3 per cent for HDPE, and 12.3 per cent for PP.

Even so, said the company, announced capacity additions will just keep up with demand.

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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/MAY 1988

Neck Bands Protect & Sell

Machinery Users Brace For Change

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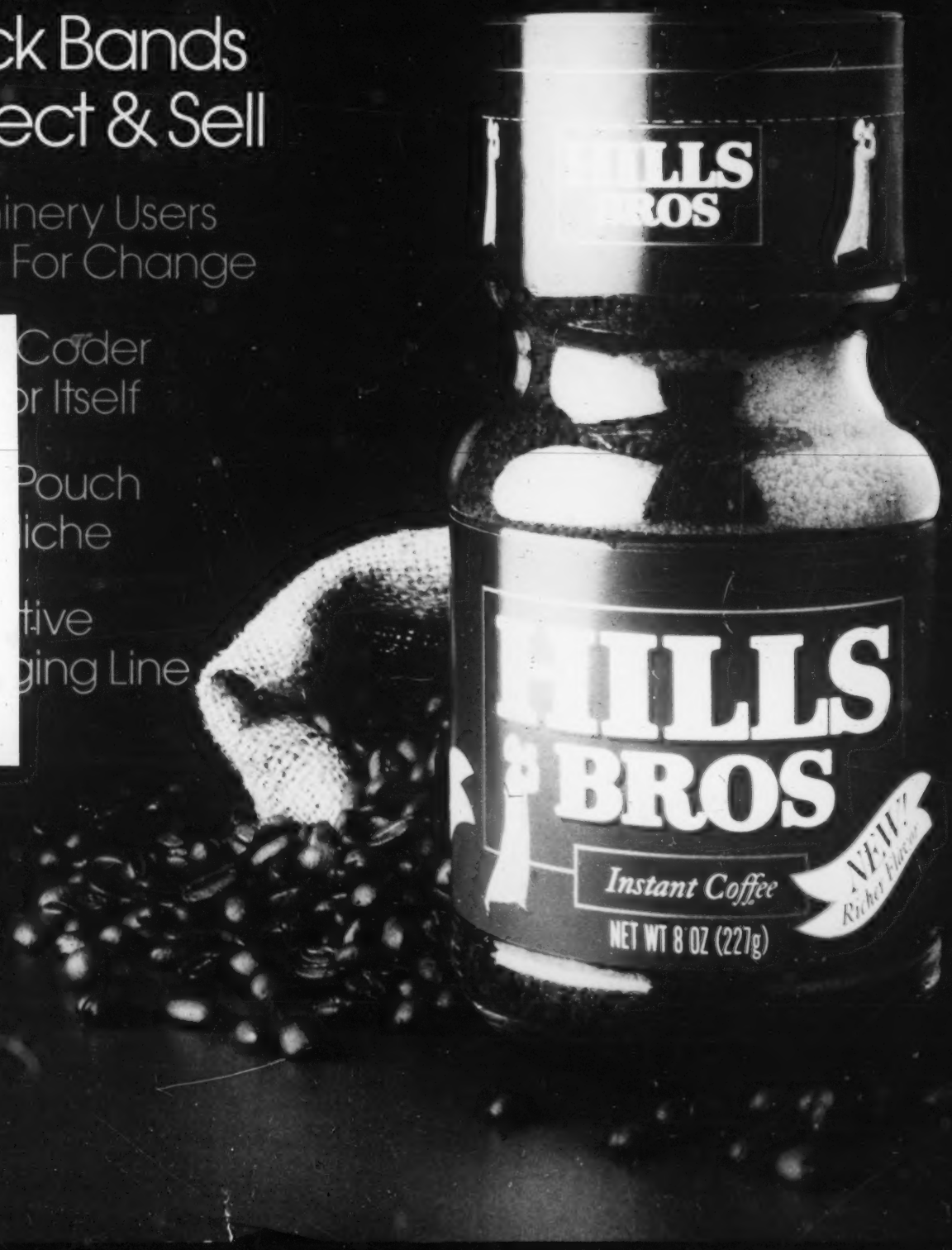

CONTENTS

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A CAHNERS PUBLICATION VOLUME 33 NUMBER 7

PACKAGING NEWS

Milk in pouch finds niche 8
U.S. dairies are finding that flexible film can be a highly competitive package for milk

Kids love Fruit Burple and its expandable burping bottle 14

S.O.S. package lets shoppers see and feel the product 15

Peggability wins better store placement for Salad Singles 16

PACKAGING FEATURES

STATE OF THE ART

Neck bands protect and sell 36
Shrink labels lead the way in tamper-evident packaging for food and personal-care products

PACKAGING OPERATIONS

Plant of the Month: Innovative packaging line 44
Everything clicked when Syntex put together a new line for its novel applicator package

Ink-jet coder pays for itself 61
A Denver food packager found a reliable coding solution that cuts downtime to 'zero'

SPECIAL REPORT

Machinery users brace for changes 54
Our latest survey reflects concerns about gearing up lines to match likely demands for flexibility

PACKAGING TECHNOLOGY

Dispenser maintains constant pressure 65
Environmentally safe container dispenses pure product at any angle or temperature

Acrylic vial is safer, lighter, less costly 71
Heavy lead is out for shipping radioactive phosphorus; acrylic vial is also easier to use

Special coating takes the 'drag' out of palletizing 91

Re-inking system reduces printer ribbon costs by 63 per cent 92

Polyethylene foam cuts paneler's packaging costs 15 per cent 104

DEPARTMENTS

EDITORIAL	3	RECYCLING NEWS	29	CLASSIFIED	105
CALENDAR	22	NEW EQUIPMENT	74	ADVERTISERS INDEX	112
PEOPLE	24	NEW MATERIALS	95	WRAP UP	112
ASSOCIATION NEWS	26	SAMPLES	103	READER SERVICE CARD	113

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Plastics Recycler Begs For Scrap

He pays well for HDPE but can't get enough

Dairymen interviewed for the milk pouch story in this issue told PACKAGING that trash-disposal advantages of the pouch could result in decreased use of the HDPE milk bottle.

That would not be good news to Kyle Wright. He wants dairies and other packagers of such products as motor oil and dishwashing soap to keep using HDPE bottles. The company for which Wright is sales director, Eaglebrook Plastics of Chicago, grinds them up either before or after they reach the consumer . . . and makes a good profit selling the regrind.

He said Eaglebrook has contracts with many blow-molders who are committed to recycling all or nearly all of their discarded HDPE. Eaglebrook buys its HDPE lumps, chunks, purgings, floor sweeps, and bad bottles for 13 to 15 cents a pound.

From bottles to 'wood' is where scrap HDPE goes at Eaglebrook Plastics. Andrew Stephens (left), company president, and Kyle Wright, sales director, here discuss the quality of regrind.

"If your business is plastics packaging and your resin costs are 50 cents a pound," Wright said, "you go out of your way to recover that material."

For some companies, Eaglebrook cleans paper-labeled HDPE bottle regrind which those companies use to make new bottles. Other companies purchase cleaned regrind from Eaglebrook for use in multilayer non-food bottle applications.

In addition, Eaglebrook has formed a new company to manufacture and market plastic lumber made from 100 per cent post-consumer dairy bottles. Applications include park benches, fences, and decking.

Wright estimates that a medium-size dairy can generate 15,000-20,000 pounds of plant scrap each month. That includes lumps and chunks plus defective bottles. "We offer to pick it up for them, grind it up for them, even drop off a trailer so they don't have to use their own warehouse to store it," he said. "But many dairies are still putting their scrap in the dumpster."

Yet he's optimistic, since landfill tipping fees are going up. "If I pay 15 cents a pound for scrap and it costs them $40 a ton to dump it, they might throw it away. But when it costs $100 a ton to dump it, you have a stronger motivation to profitably dispose of it."

Aluminum Supplier Touts Anniversary

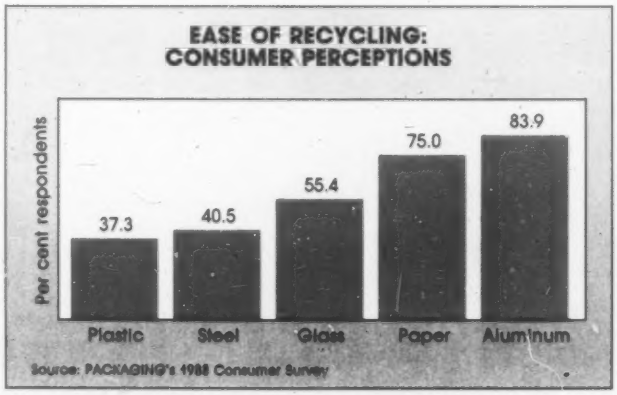
Can program hits 20-year mark

Reynolds Metals Co., Richmond, Va., this spring is celebrating the 20th anniversary of the launching of the nation's first consumer-oriented recycling business.

In 1968, when Reynolds Metals Co. initiated cash-for-cans recycling, only three soft drinks and five brands of beer were being packaged in aluminum cans. Today aluminum cans enjoy a 95 per cent share, and consumer recycling of aluminum beverage cans has grown into a multimillion-dollar industry.

In the first year of the recycling program, a company spokesperson said, Reynolds recycled one million pounds of aluminum. Today the company exceeds that amount every day.

Reynolds estimates that recycling has reclaimed more than 10 billion pounds of aluminum since '68. ■



Consumers Rank Recycling Ease

Not all packaging is equal, they say

In its 1988 Consumer Survey, PACKAGING magazine asked 1,000 consumers nationwide a number of questions about packaging as it related to recycling.

More than 750 consumers responded to the question "How easy is it to recycle the following packaging materials?"

As shown on the accompanying graph, aluminum led the field with the most "Easy" answers and fewest "Difficult" replies. Paper came in second, glass third, and steel fourth. Plastics by far received the fewest number of "Easy" replies—only 37.3 per cent.

A full report on PACKAGING's 1988 Consumer Survey will be published in our June issue.

Recycling To Become A Major Industry

Incineration also seen growing steadily

Business Communications Co. (BCC), Norwalk, Conn., has published a report on trends in the disposal of plastics packaging waste through the year 2002. The report predicts that landfilling will remain flat while recycling and incineration grow.

According to the report, 96 per cent of plastics-packaging scrap went to landfills in 1987, about 3 per cent was incinerated, and 1 per cent was recycled. By the year 2000, only 37 per cent will be landfilled, 18 per cent will be incinerated, and 42 per cent will be recycled.

Today, said the group, only 150 million pounds of post-consumer plastic packaging scrap is recycled out of a total 14 billion pounds consumed. BCC forecasts that by 1992, roughly 5.5 billion pounds of it will have to be separated for recycling.

MACHINERY USERS BRACE FOR CHANGES

Our latest survey reflects concerns about gearing up packaging lines to match likely demands for flexibility

By R. Bruce Holmgren
Editorial Director

All across industry, we now find companies taking a new attitude toward the phenomenon of manufacturing. Today's emphasis is clearly on flexibility. Packaging, as an integral part of manufacturing in food, pharmaceuticals and a wide array of other industries, is one of the centers of the action stemming from the shift in attitude.

Therefore, it comes as no surprise to note the relation-

THE BACKGROUND: MACHINERY IN USE TODAY	Meats	Poultry, Eggs	Butter, Cheese	Ice Cream, Frozen Desserts	Fluid Milk	Canned Foods	Dehydrated Foods	Sauces, Dressings	Frozen Foods	Milling	Cereal Breakfast Foods
Bagging, Preform Bags	750	257	-0-	66	-0-	373	26	219	407	474	-0-
Bar Coding/Scanning	878	1075	265	-0-	226	287	-0-	16	315	80	63
Blowmolding	-0-	-0-	3	43	789	-0-	-0-	-0-	-0-	-0-	15
Bottle Cleaners	-0-	-0-	104	-0-	-0-	958	-0-	594	-0-	47	-0-
Bottle Unscrambling	-0-	-0-	20	-0-	-0-	655	-0-	244	-0-	3	-0-
Bundle Wrap/Banding	1062	374	364	152	518	795	149	277	829	208	-0-
Capping	-0-	-0-	115	22	789	1062	8	581	-0-	44	22
Cartoning	348	167	431	131	980	303	39	140	303	449	381
Case Closing/Sealing	1537	745	933	121	1008	2561	91	638	2494	246	785
Case Forming	2159	416	383	22	653	759	-0-	288	700	151	437
Case Packers	878	-0-	597	43	1353	2292	69	742	2224	168	803
Checkweighers	4594	1063	1129	88	827	1177	582	343	1245	862	1088
Coding & Marking	4301	2840	1625	241	1932	2395	121	827	2429	635	877
Conveyors	13,633	6810	4266	1271	5415	9811	574	2729	9879	3459	571
Fillers, Dry	-0-	-0-	383	-0-	226	502	119	484	535	1077	459
Fillers, Liquid	-0-	301	594	329	3514	2588	-0-	761	2622	69	22
Form-Fill-Seal, Horiz.	1921	-0-	524	66	526	278	457	296	312	198	814
Form-Fill-Seal, Vert.	-0-	-0-	336	22	377	402	257	257	547	66	237
Gluing/Hot Melt	2946	849	1213	247	1683	2771	517	1155	2635	471	1791
Jet Printers	1427	-0-	667	66	980	1180	118	599	1146	173	155
Label Imprinting	915	641	-0-	22	226	185	8	16	-0-	29	-0-
Labeling	4758	1242	921	66	937	2656	68	832	2689	117	96
Line Dividers/Conveyors	988	290	470	110	677	1987	84	140	2021	75	78
Metal Detectors	5288	972	431	110	379	637	68	249	603	253	959
Neck Band/Body Sleeve	-0-	-0-	22	-0-	-0-	81	-0-	120	-0-	-0-	-0-
Net Weigher	1226	137	271	22	-0-	616	43	79	650	184	33
Overwrapping	439	969	194	22	-0-	81	-0-	140	115	-0-	-0-
Palletizing	146	-0-	635	66	226	2160	-0-	189	2092	395	181
Shipping Tray Form/Close	531	-0-	-0-	43	-0-	402	-0-	31	435	-0-	22
Shrink Wrapping	769	802	98	110	377	587	56	281	519	78	93
Stapling	713	361	177	22	-0-	352	-0-	80	-0-	-0-	-0-
Strapping	1190	541	286	-0-	226	291	-0-	147	325	-0-	22
Stretch Wrapping	1811	862	361	131	526	965	49	172	999	338	219
Taping	5637	1046	1513	199	1008	975	146	330	1127	367	91
Timing Screws	-0-	-0-	134	-0-	157	2377	-0-	717	2411	572	-0-
UPC Scanning	348	-0-	121	-0-	-0-	106	-0-	-0-	-0-	31	100
Uncasers	-0-	-0-	-0-	-0-	-0-	452	-0-	79	-0-	-0-	37

Packaging engineers face a variety of challenges for the future and have voiced overriding concerns about adapting lines to many different packages.

ship between today's focus on flexibility and the main points of PACKAGING's latest survey of its readers concerning their wants and intentions relating to machinery. More to the point, taken together, the forward thinking of typical major users of packaging machinery and the bare bones findings of the survey provide us a picture of the situation today and an explanation of what this picture means for tomorrow.

Readers responding to our survey ranked 21 requirements in terms of their im-

Pet Food	Bread: Cake	Cookies: Crackers	Cane and Beet Sugar	Confectionery	Malt Beverages	Wines: Liquor	Soft Drinks	Extracts: Syrups	Fish	Roasted Coffee	Food N.E.C.	TOTAL
1234	2447	222	226	354	-0-	-0-	284	14	-0-	104	361	7818
208	149	112	25	341	29	71	-0-	14	-0-	105	211	4470
-0-	-0-	-0-	-0-	-0-	-0-	-0-	100	26	-0-	-0-	-0-	976
-0-	-0-	-0-	-0-	157	231	960	913	53	-0-	105	392	4514
140	-0-	-0-	-0-	157	-0-	524	-0-	40	-0-	111	308	2202
594	232	292	107	262	58	-0-	849	78	-0-	11	612	7924
210	-0-	-0-	-0-	211	187	1123	2027	145	-0-	180	671	7397
145	1187	294	16	612	84	74	100	131	456	-0-	833	7604
481	1162	473	253	1389	310	685	813	171	1345	188	1265	19,694
326	442	346	114	358	232	36	1014	92	-0-	-0-	325	9253
488	736	215	136	701	696	717	3047	131	-0-	-0-	499	16,535
602	2291	1017	316	1765	216	103	585	328	1778	203	1916	24,118
1387	2783	910	316	2758	380	387	2099	249	1778	340	3751	35,361
6482	16,538	1495	4425	5009	2481	2271	32,607	1651	4445	900	7676	144,398
616	-0-	-0-	464	493	-0-	-0-	-0-	92	-0-	190	1857	7497
419	-0-	-0-	-0-	211	466	1203	3969	276	-0-	-0-	922	18,266
70	315	778	16	1231	-0-	-0-	-0-	302	456	-0-	920	9480
210	525	561	228	1691	-0-	-0-	-0-	852	-0-	195	1775	8538
665	2539	1044	325	2067	911	1142	2814	450	1819	188	3497	33,739
280	1442	245	60	311	452	475	2899	249	456	129	657	14,166
-0-	872	42	40	157	38	29	-0-	26	-0-	105	837	4188
581	2315	346	66	1075	916	1074	1442	341	889	119	1927	25,473
210	1648	233	79	813	718	268	1354	118	-0-	360	484	13,206
154	3443	1014	191	2418	-0-	-0-	-0-	26	1778	195	833	20,001
-0-	-0-	-0-	-0-	-0-	-0-	192	-0-	14	-0-	104	85	618
70	0-	-0-	120	479	-0-	-0-	-0-	26	1345	275	474	6050
111	1975	453	24	655	52	-0-	-0-	-0-	-0-	-0-	333	5563
518	405	252	221	351	770	485	4181	197	433	111	402	14,416
-0-	256	-0-	-0-	146	98	-0-	777	14	-0-	-0-	272	3027
364	620	152	45	723	17	20	393	40	-0-	-0-	539	6683
-0-	-0-	-0-	-0-	-0-	-0-	96	-0-	92	-0-	-0-	366	2259
-0-	108	-0-	-0-	136	-0-	129	401	40	-0-	-0-	366	4208
742	706	231	195	557	111	143	785	157	497	112	703	11,372
945	1622	805	128	1787	37	227	320	157	564	115	1996	21,142
-0-	-0-	-0-	-0-	201	591	2585	2178	66	-0-	465	1199	13,653
-0-	260	145	-0-	111	-0-	97	-0-	-0-	456	104	91	1970
-0-	-0-	-0-	-0-	-0-	360	440	2198	52	-0-	96	85	3799

Source: Cahners Research, 1987 Packaging Machinery Study

With high tech or without it, tomorrow's lines must be flexible

portance. Heading the list are simplicity of changeover, ability to handle a wide range of materials or containers, and an ability to clean without disassembly.

They ranked maximum speed, a factor which we often hear is so important if not dominant, only in fourth place—and just about extra guarding for safety, followed by price. After that, a whole succession of factors, with diagnostics well down on the list; reveal our readers' priorities.

At the very bottom of the list came automatic, computer-guided changeovers, and single-purpose machines. (Obviously, these rankings are an oversimplification, as readers interpret "importance" in many subjective gradations, but the general conclusions deserve attention, since they reflect the changes transpiring in industry and in packaging.)

Face many uncertainties

Looking beyond the mere assertion that flexible manufacturing—and packaging—is now the order of the day, we find that what our readers face is widespread uncertainty about tomorrow. In the context of packaging, this uncertainty dictates a sensing for, almost a preoccupation with, being able to handle more or different packages—and with capacities and volumes shrouded in corresponding uncertainty.

Reducing all these generalities and abstractions to the concrete realities of what is now taking place, we find confirmation of all this in the views presented—quite coincidentally—by a number of managers and professionals at the recent University of Wisconsin program on planning, laying out and equipping a packaging line.

As a starter, J. Morris Binder, vice president for science and technology, Tone Brothers, Des Moines, stressed the importance of forecasts of likely volumes and sales—and cycles—of products as a basis for developing or upgrading the packaging lines to run them on. His point was that flexibility not only of products but also of entire operations will be the rule rather than the exception from now on.

Translating forecasts into packaging-line capacity or output requirements, Binder told of the need to reach close decisions (such as one line vs. two, or lower capacity) to be ready to go either way, in event of demand changes.

J. Edward Morrah, director, division engineering, Vicks Manufacturing, Richardson-Vicks Inc., Greensboro, N.C., and Charles Mayer, vice president of operations, Sather Inc., Round Lake, Minn., also noted the pressing need for flexibility. "Flexibility becomes the strategy—we're all going to made-to-order manufacturing," Morrah predicted. "The big thing is to make your lines as flexible as you can," Mayer added.

Adapt to flexibility

Bracing for all these upcoming changes, the respondents to our survey reveal their concern about meeting the uncertainties inherent in such changes when they rank a number of other factors that guide their machine choices. An open construction for ease of access, an ability to do clean-up and changeover without tools, and even such features as self-cleaning were high on the list.

These latter factors reflect the concern users have about the fitting of a new machine into an existing line or as part of the upgrading of a line. The ranking of these factors not only reveals a desire for immediate efficiency with minimum losses of time but also calls attention to some of the frequently neglected factors in machinery selection. One leading example of such factors is that of maintenance.

At the Wisconsin program, Steve McCormick, manager of maintenance, Miller Brewing Co., Milwaukee, hit hard on that very point—the importance of keeping in mind the likely need for maintenance when selecting this or that machine. Noting the trend toward reduced operator involvement and more monitoring of a machine, McCormick urged his audience to plan for maintenance on a plantwide basis.

While the comments about maintenance match the concerns of machine buyers, it is worth remembering that a firm such as Miller Brewing uses the top speeds and high volumes of a particular industry. Therefore, when McCormick noted the general trend to electronic and computer-based control, monitoring of entire lines, as well as higher speeds as well as equipment changeover that contribute to greater package flexibility, we need to keep in mind that many companies do not apply that refined a level of the so-called high tech of packaging.

How much high tech?

In other words, while it goes without saying that the larger firms, such as those in the Fortune 500, seek the high level of technology and have the resources to pay for it, the large numbers of smaller companies—and the smaller plants of the big firms, too—often limit their use of high tech.

Another aspect of our survey is the ranking of machin-

Factors which survey respondents rate 'extremely important' in machinery selection

Per Cent	Factor
41	Simplicity of changeover
29	Ability to handle wide range of materials/containers
28	Ability to clean without disassembly
25	Maximum speed
23	Extra guarding for safety
20	Price
18	Open construction for accessibility
17	Built-in programmable controllers
17	Clean-up, changeover without tools
17	Self-cleaning
14	Memory capability to control 11 settings
13	Special or unusual space limitation
13	Easy-to-read diagnostics
13	Diagnostics in flow chart
12	Diagnostics with panel lights
10	Vision systems
10	Multi-purpose or monobloc machines
7	Automatic adjustment by computer
6	Accumulating conveyors between machines
6	Automatic, computer-guided changeovers
3	Single-purpose machines

ery which users plan to buy during the coming year. The top five in popularity—all above 20 per cent—are conveyors (a whopping 48 per cent of the survey respondents plan to buy them), checkweighers, liquid fillers, labelers and jet printers.

As to conveyors, we can conclude that much revision of existing lines or the equipping of new lines (perhaps with a rearranging of equipment already in the plant) is a major coming activity.

With checkweighers, liquid fillers, and labelers, the most casual tour of any of the recent major packaging shows reminds us that the various manufacturers offer considerable upgrading and updating over previous models.

Extend today's capacity

Interestingly enough, the projected plans by users to buy such equipment in the near future represents a clear extension of the findings of a major study by Cahners Publishing Co.—research which tallies up the across-the-board total of packaging machinery usage.

For instance, to take only three examples, as to the most popular planned purchase, that of conveyors, we note that USA plants packaging food and kindred products now use 144,398 conveyors, of which 8,846 were purchased in the last 12 months, for use on 42,313 packaging lines, of which 2,480 represent new packaging lines.

For the same industries and plants, the Cahners research shows 24,118 checkweighers in use, with 2,173 purchased in the last 12 months for use on the same 42,313 packaging lines. Likewise, for liquid fillers, some 18,266 are in use, with 1,670 purchased in the last 12 months, for these 42,313 lines.

Tending to project the same findings about existing equipment is another finding from our survey, noted earlier. It is that over 80 per cent of the respondents plan to spend the same or more in 1988 as in 1987. Further, 35 per cent plan to make major expenditures—from upward of $100,000 to $1 million or more.

Basic machines, or even basic lines aside, what about the use of high tech—such as information systems, robotics or the like? Principal users of management information systems for machines and entire lines, understandably, are the larger installations of the larger companies. Further, survey findings show that many firms not now using such systems plan to do so in the future.

> Machines you pick today must meet tomorrow's mandate for made-to-order manufacturing

Robotics pro and con

Robotics? Our survey results ran all over the lot and while only a majority of the respondents now use robotics, others plan to do so. What about those not using or not even expecting to have robotics? Our findings show some interesting responses to the question of "why not" use robotics.

Some said their companies or operations are too small, while others simply dismissed robotics as not applicable. Yet many positive notes turned up, such as in responses saying, ". . . waiting for the right application" and so on. Our question also generated some responses with feelings: "Too far out . . . too slow, too complicated, just a toy . . . too high tech . . ." and so on.

Our survey aside, a perspective on robotics worth sharing in this context came from Charles Craven, consulting engineer, S.C. Johnson & Son, Racine, Wis., during the University of Wisconsin program. "While robotics cannot do all packaging operations, in many operations they offer significant improvement and a degree of flexibility not available with standard systems," he noted.

He sees robotics as only one element in an entire system or family of flexible automation, which he described as using high-level process control, automatic set-up, servo-controlled features, self-diagnostics, real time communications, and remote communications. He suggested flexible automation as appropriate for an entire range of class, even a family of products, as distinguished from the one or two products which usually represent the focus of hard automation and its inherent difficulties of modification.

In this sense, Craven echoes the views and concerns of many seasoned managers and professionals, pointing up the need to prepare for the rising use of flexible manufacturing —with packaging and its machinery inextricably enmeshed in the coming changes, as the respondents to our surveys have seemed to sense. ■

R. BRUCE HOLMGREN
Editorial Director

"The widely-heralded shift to flexibility in manufacturing is now here—with individual packaging machines as well as entire packaging lines geared up to speedy shifts from container to container, product to product, with minimum loss of time between these run changes."

PLEASE RATE THIS ARTICLE

How would you rate this article? To reply, circle the appropriate number on the reader service card:

Outstanding	436
Above Average	437
Average	438
Below Average	439

What survey respondents report they 'plan to buy' in the next 12 months

Per cent	Category of Equipment
48	Conveyors
25	Checkweighers
25	Liquid fillers
24	Labelers
21	Jet printers
20	Tapers
20	Stretch wrappers
18	Case closers, sealers
16	Hot-melt gluers
16	Line dividers/conveyors
14	Bundle wrappers, banders
13	Cappers
13	In-line coders, markers
12	Metal detectors
12	Case formers
11	Bar coders, scanners
10	Label imprinters
9	Palletizers, depalletizers
8	Baggers (using preformed bags)
8	Strappers
7	Overwrappers
7	Bottle unscramblers
7	Dry fillers
7	UPC scanners
6	Vertical form-fill-seal units
6	Shrink wrappers
6	Timing screws
5	Machine vision systems
5	Cartoners
5	Neck banders, sleevers
5	Blow molders
4	Bottle cleaners
4	Horizontal form-fill-seal units
4	Net weighers
4	Aseptic packers
4	Shipping, tray formers/closers
4	Staplers
3	Skin, blister machinery
3	Thermoform-fill-seal units
3	Vibration, shock test equipment
1	Uncasers
1	Tube fillers

6/15/88

PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/JUNE 1988

CONSUMER SURVEY: Which packages do consumers like?

Oxygen Absorber Extends Shelf Life

Interphex '88 Show Guide

Glass Line Runs 500/Min

High-Profit Packages

CONTENTS

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A CAHNERS PUBLICATION VOLUME 33 NUMBER 8

PACKAGING NEWS

High-profit packages 8
New software shows how fractions of an inch add thousands of dollars to product profits

Unique Pillsbury package has "authentic pizzeria look" 14

On-package game hikes sales, eliminates card 15

New closure makes Tide box reclosable, fingernail-friendly 16

PACKAGING FEATURES

SPECIAL REPORTS

Consumer Survey: Which packages do consumers like? 42
Americans say they want greater convenience, microwavability, tamper-evidence and recyclability

Interphex USA '88 Show Guide 78
Packaging conferences and exhibits are a major part of the pharmaceutical, cosmetics show

PACKAGING OPERATIONS

Plant of the Month: Glass line runs 500/minute 56
Mid-level automation, simple controls assure top speed at this Italian plant

STATE OF THE ART

Microwave technology heats up 66
Suppliers are stampeding to introduce new shapes, structures and enhancements. But what about safety?

MARKETING

Aseptic milk finds foodservice niche 72
Dairy targets non-consumer market and scores big with shelf-stable, paperboard package

PACKAGING TECHNOLOGY

Oxygen absorber extends shelf life 83
Molecule absorbs oxygen in packages, acts as barrier in polymers, indicates tampering

Bags rolls up as contents exit 87
Inventor lets flat spring in box roll up bag's tail—automatically

Fragile art glass 'floats on air' 91
One-of-a-kind glass artworks are safely moved worldwide suspended inside the shipping case

Induction sealing for tamper-evidence adopted by H.J. Heinz 108

Fire-retardant packaging mandated by U.S. Navy Aviation Supply 120

Computer-printable label stock allows for last-minute changes 122

Collapsible container saves space, takes rough handling 123

DEPARTMENTS

EDITORIAL	3	RECYCLING NEWS	31	CLASSIFIED	124
CALENDAR	22	NEW EQUIPMENT	96	ADVERTISERS INDEX	133
PEOPLE	24	NEW MATERIALS	113	WRAP UP	134
ASSOCIATION NEWS	26	SAMPLES	118	READER SERVICE CARD	135

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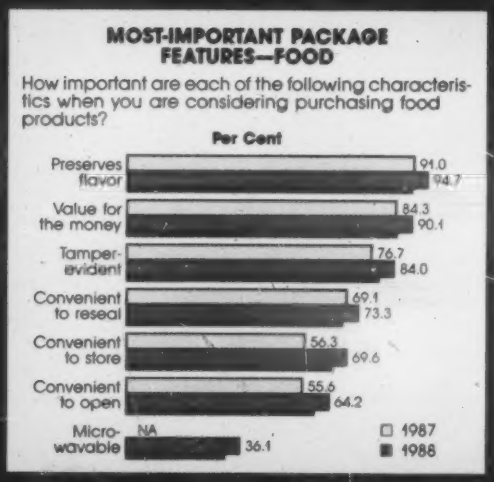
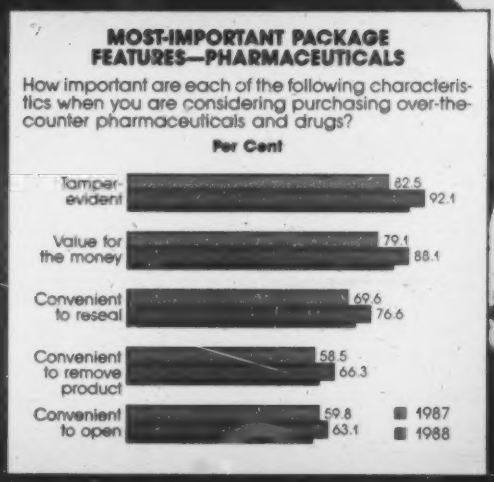

MOST-IMPORTANT PACKAGE FEATURES—FOOD
How important are each of the following characteristics when you are considering purchasing food products?
Per Cent
Preserves flavor
91.0
94.7
Value for the money
84.3
90.1
Tamper-evident
76.7
84.0
Convenient to reseal
69.1
73.3
Convenient to store
56.3
69.6
Convenient to open
55.6
64.2
Micro-wavable
NA
36.1
1987
1988


MOST-IMPORTANT PACKAGE FEATURES—PHARMACEUTICALS
How important are each of the following characteristics when you are considering purchasing over-the-counter pharmaceuticals and drugs?
Per Cent
Tamper-evident
82.5
92.1
Value for the money
79.1
88.1
Convenient to reseal
69.6
76.6
Convenient to remove product
58.5
66.3
Convenient to open
59.8
63.1
1987
1988

PACKAGING's 4th Annual Consumer Survey

CONSUMERS GET TOUGH WITH PACKAGING

Americans say they want greater microwavability, tamper-evidence, convenience, and recyclability

By Greg Erickson
Senior Editor

American consumers can't be expected to know all the ins and outs of packaging, but they know what they like. Without question, their attitudes affect the marketing efforts of packaging suppliers and end users everywhere.

To find out what consumers like and dislike about packaging trends, PACKAGING magazine each year conducts a comprehensive Consumer Survey. In preparing this year's study, PACKAGING's editors developed 44 questions pertaining to crucial industry issues. Then, working with NFO Research, Inc., an experienced and respected consumer research firm, PACKAGING distributed the questionnaire to 1,000 households.

A total of 756 consumers responded to the survey—a 75.6 per cent return rate, which NFO termed "higher than average" for surveys of this type. PACKAGING likewise sees the results of the 1988 Consumer Survey as above average in terms of the reliability and usefulness of the data. The results are accurate to within plus-or-minus 4 per cent.

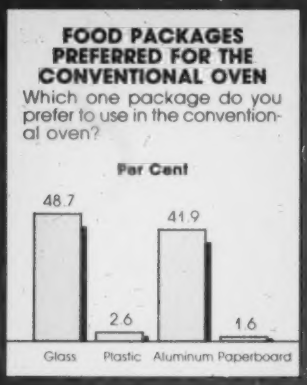
The full report contains a vast amount of information about the entire sample group as well as consumers in nine "lifestages" categories, four geographic divisions, four age groups, and four income groups.

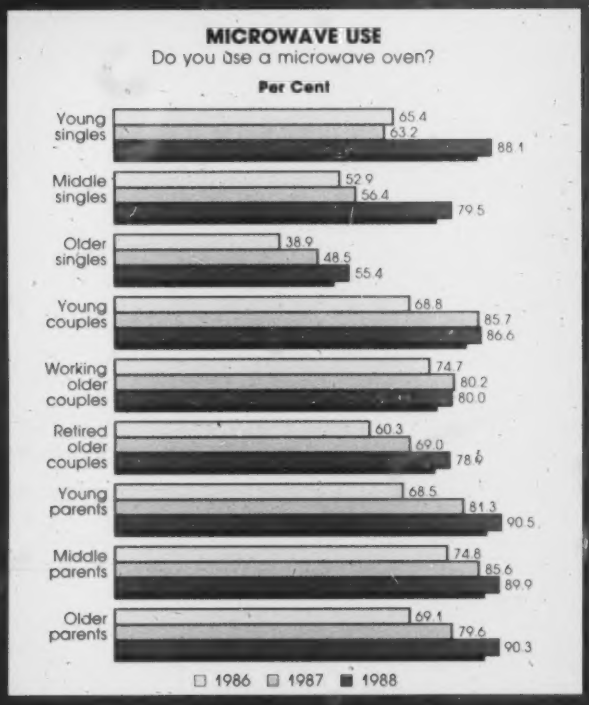
Space does not permit discussion of all the findings. (See the box at the end of this article for more information about the complete 400-page report.) Here are highlights.

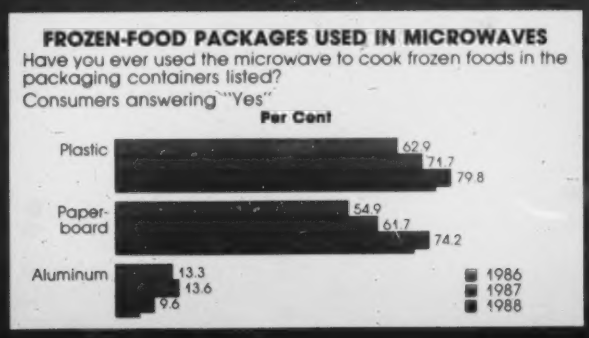
What do American consumers really think about packaging? This year, of the 1,000 households contacted, 756 responded. Their opinions are informative . . . even astonishing.

25%

more young singles used a microwave oven this year than in 1987







Use of microwave ovens increased among survey respondents by almost 10 per cent 1987-1988, to 83.1. The greatest increases in microwave use 1987-88 were within two lifestages: Young Singles, up 24.9 per cent, and Middle Singles, up 23.1 per cent. Increases of roughly 10 per cent also occurred in lifestages Retired Older Couples, Young Parents, and Older Parents.

Frozens in the microwave

Which packaging materials do consumers use for their microwave cooking? For frozen foods, nearly 80 per cent of the respondents said they used plastic containers; 74.2 per cent used paperboard. Less than 10 per cent said they used aluminum.

PACKAGING asked, "Which one package do you prefer to use in the microwave oven?" Almost half the consumers checked glass. This response was surprising because so few foods promoted as microwavable are now packaged in glass. It is possible that some of the consumers misunderstood the question. However, it is also possible that the respondents really did want to say they would prefer glass packaging for microwavable foods: Elsewhere in the survey, respondents reported a strong preference for glass as a food-packaging material.

Other food-packaging materials and the percentages of respondents who said they preferred them for use in the microwave: plastic, 33.3 per cent; paperboard, 10.7 per cent; aluminum, 1.1 per cent.

Use of aluminum as a container material for frozen foods cooked in conventional ovens ran to 80 per cent. About 30 per cent of the respondents said they used paperboard containers in this way; more than 22 per cent said they used plastic.

When asked to choose just one preferred food container material for use in the conventional oven, almost half of the 756 respondents again picked glass. Factors that affected the responses for microwavable foods packaging may have come into play here also.

About 42 per cent picked aluminum for the conventional oven; less than 3 per cent said they preferred either plastic or paperboard.

Another surprise

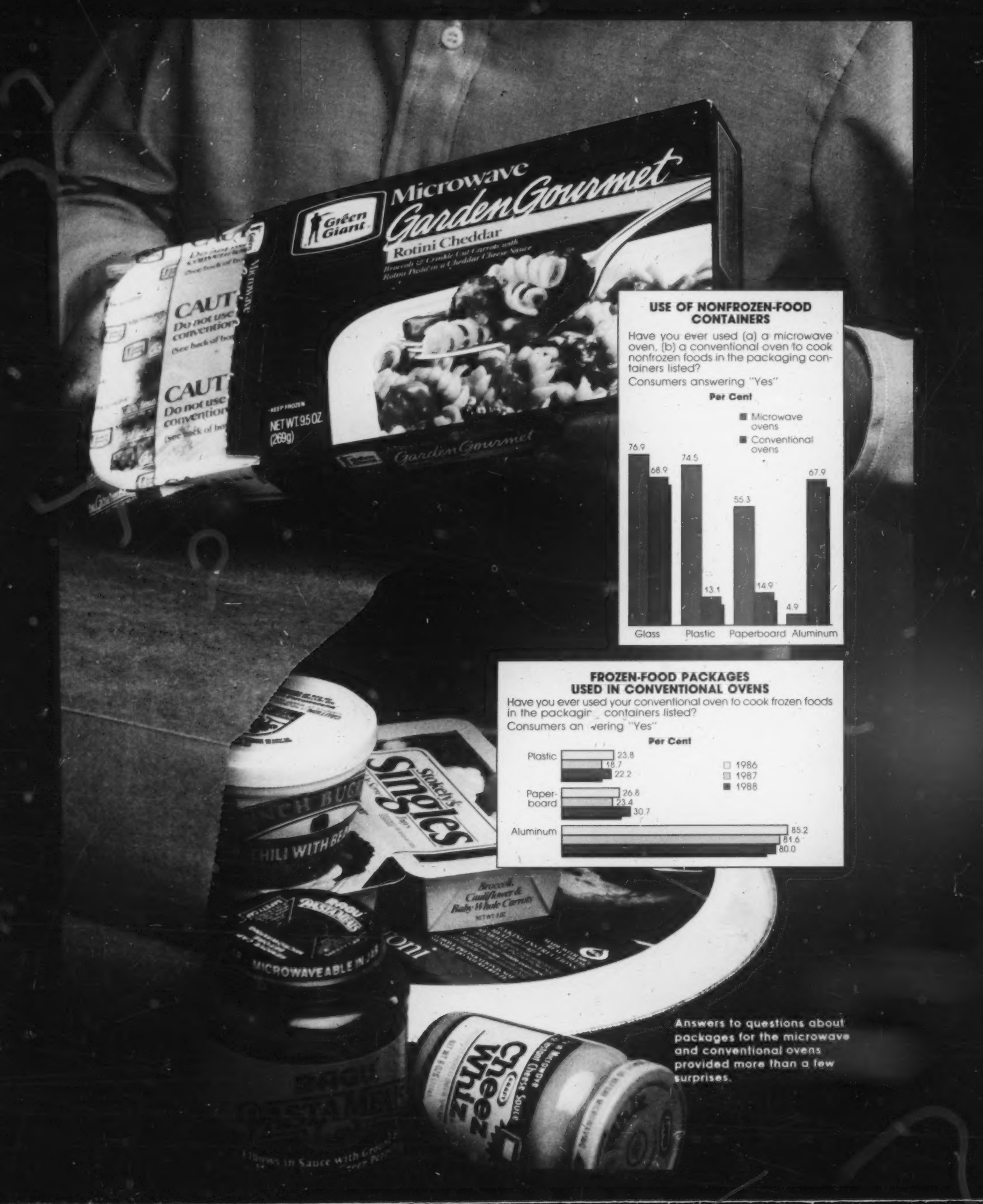
PACKAGING asked consumers which packaging materials they preferred for a variety of foods. A surprise appeared in the responses for soup. More than 61 per cent of the 1988 respondents said they preferred plastic containers—almost five times as high a percentage as said so last year. Metal came in second in 1988, with 25 per cent; glass followed with 10.8. In 1987, metal cans took 66.7 per cent; glass jars, 14.8 per cent; plastic containers, 12.8.

To verify the validity of this dramatic change in preference, PACKAGING reported the 1987-1988 figures to a spokesperson for a major soup-processing company, which still packages by far the largest portion of its soups in metal cans. He, too, called the results surprising, but not wildly so.

The spokesperson offered three reasons why the switch in preference from metal to plastic seemed logical to him: (1) a growing consumer feeling that soups in cans are overcooked and somehow "artificial"; (2) an increasing consumer demand for packages that eliminate the need for can openers, pots and pans, and bowls; and (3) the microwave explosion.

Glass received preference votes from 44.3 per cent of the 1988 respondents for cooked pasta—nearly as many as for plastic, metal, and paperboard containers combined.

For soft drinks, glass was favored by more than 41 per cent of the consumers, metal and plastic by 28.6 and 26.3 per cent, and paperboard by



USE OF NONFROZEN-FOOD CONTAINERS

Have you ever used (a) a microwave oven, (b) a conventional oven to cook nonfrozen foods in the packaging containers listed?

Consumers answering "Yes"

Per Cent

Microwave ovens
Conventional ovens

	Microwave ovens	Conventional ovens
Glass	76.9	68.9
Plastic	74.5	13.1
Paperboard	55.3	14.9
Aluminum	4.9	67.9

FROZEN-FOOD PACKAGES USED IN CONVENTIONAL OVENS

Have you ever used your conventional oven to cook frozen foods in the packagir containers listed?

Consumers an vering "Yes"

Per Cent

	1986	1987	1988
Plastic	23.8	18.7	22.2
Paper-board	26.8	23.4	30.7
Aluminum	85.2	81.6	80.0

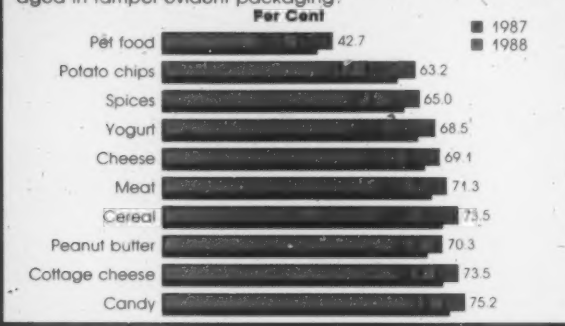
Answers to questions about packages for the microwave and conventional ovens provided more than a few surprises.

82%

of all respondents checked for signs of tampering when they shopped

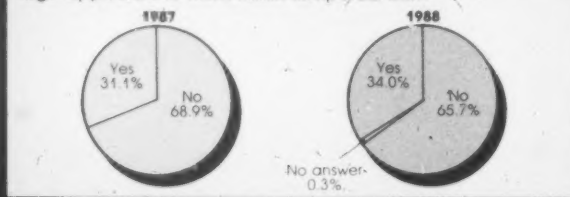
WHICH FOODS SHOULD BE TAMPER-EVIDENT?

Which of the following types of foods do you feel should be packaged in tamper-evident packaging?



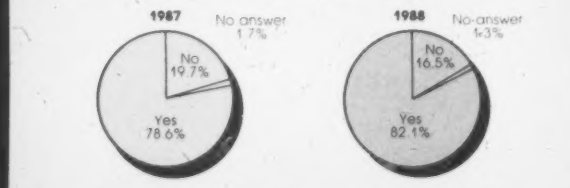
PRODUCT REJECTIONS BECAUSE OF TAMPERING

During the past six months, have you avoided purchasing any pharmaceuticals or food products because the product package appeared to have been tampered with?



LOOKING FOR SIGNS OF TAMPERING

When you last purchased a pharmaceutical or food product, did you check for evidence of tampering?



FOOD PACKAGE MATERIALS RATINGS

Assuming that products were available in all of the following package types, which type of container would you prefer for each of the food products listed?

	Glass		Plastic		Metal		Paperboard		No Answer	
	'88	'87	'88	'87	'88	'87	'88	'87	'88	'87
Soup	10.8	14.8	61.2	12.8	25.0	66.7	0.9	1.4	2.0	4.3
Cooked pasta	43.3	46.6	20.6	19.8	17.7	16.0	8.5	5.5	4.9	9.2
Beef stew	30.0	29.3	12.7	13.6	51.5	47.2	2.6	0.8	3.2	9.2
Ground coffee	13.0	16.5	11.2	15.3	63.4	55.2	8.9	6.1	3.6	6.9
Tuna fish	6.9	9.8	7.8	10.1	82.4	74.6	0.5	1.0	2.4	4.4
Tomato sauce	30.4	30.0	10.3	14.8	54.9	44.9	2.5	3.5	1.9	6.3
Vegetables	20.4	25.8	17.5	18.2	51.5	45.5	8.7	4.7	2.0	5.8
Fruit	34.0	40.5	17.7	18.6	40.7	31.5	4.4	3.3	3.2	6.1
Soft drinks	41.3	34.3	26.3	28.0	28.6	30.5	1.1	2.1	2.8	5.1
Beer	45.1	39.5	4.9	7.2	36.8	34.1	0.8	1.0	12.4	18.2
Wine	81.1	68.9	4.2	7.9	2.2	4.0	1.5	1.5	11.0	17.6
Juice drinks	55.2	NA	19.6	NA	11.5	NA	11.9	NA	1.9	NA

1.1 per cent.

As a beer package, glass won out over metal by 8.3 percentage points nationwide. Regional differences were significant: The highest percentage selecting glass—55.8—appeared among residents of the Northeast. The highest percentage preferring metal—44.7—came from the North Central region. Beer-container preferences differed also by lifestage. The percentage of Young Singles who said they preferred glass was the highest of any age category: 71.4. The highest percentage of votes for metal —44.6—came from the Older Singles group.

Glass remained the preferred package for wine. At more than 81 per cent, the 1988 preference rating for glass bottles was up by roughly 12 points from '87. (Most of the increase might be attributable to a smaller percentage of "don't know/no answer" responses this year.)

New category: juice drinks

For 1988 PACKAGING added a new beverage type, juice drinks. Well more than half the respondents said they preferred glass containers for these beverages. And plastic, receiving nearly 20 per cent of the preference vote, beat out metal and paperboard by roughly 8 percentage points each.

Among container materials for ground coffee, the 1987-1988 preference for metal increased by 8 points to almost two-thirds of the respondents while preference for plastic and glass dropped.

Metal containers also received the highest percentages of preference votes for beef stew, tuna fish, tomato sauce, vegetables, and fruit. More than 8 per cent of all respondents said they preferred paperboard as a packaging material for cooked pasta, ground coffee, and vegetables.

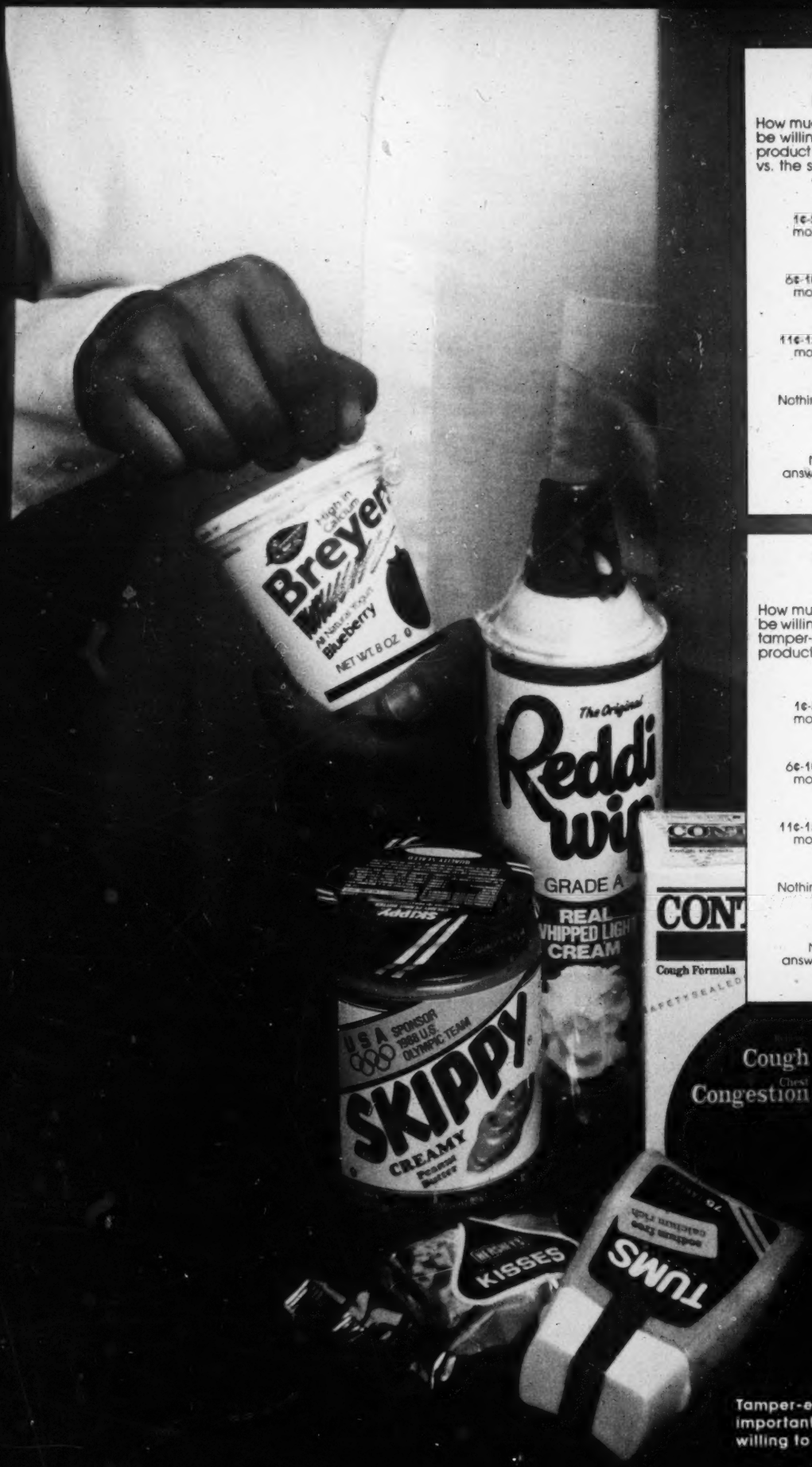
Given an opportunity to list foods they felt should be sold in tamper-evident packaging, consumers responded this year much as they did last year. The percentages ran highest to lowest in this order: candy, cottage cheese, peanut butter, cereals, meat, cheese, yogurt, spices, potato chips, pet food.

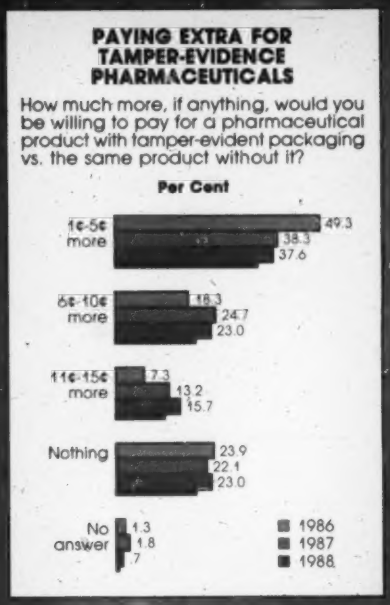
In 1987, less than 79 per cent of the survey respondents said they had looked for signs of product tampering when they shopped. In 1988, slightly more than 82 per cent said so. And the percentage of consumers who reported that they had avoided purchasing a product within the past six months because it appeared to have been tampered with rose by 3 points 1987-1988 to 34.0.

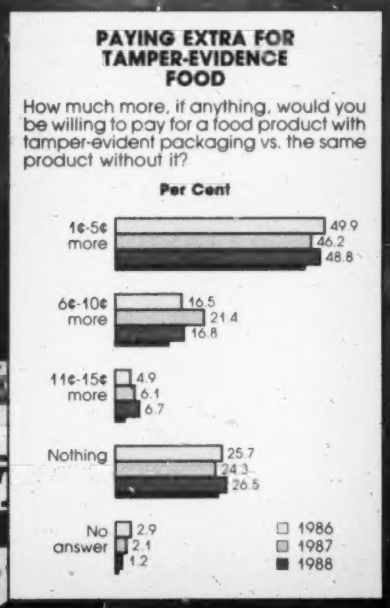
More proof that tamper evidence is still on the consumer's mind: Requested to rate the importance of various packaging characteristics, the respondents put tamper-evident packaging at or near the top. More than 92 per cent of the respondents said tamper-evident packaging was "extremely/very important" for pharmaceuticals packaging; 84.0 per cent said so regarding foods packaging.

Other pharmaceuticals packaging traits and their percentages of "extremely/very important" ratings were: value for the money, 88.1; convenient to reseal, 76.6; convenient to remove product, 66.3; convenient to open, 63.1. Other food packaging traits and percentages of respondents rating them "extremely/very important" were: preserves flavor, 94.7; value for the money, 90.1; convenient to reseal, 73.3; convenient to store, 69.6; convenient to open, 64.2, microwavable, 36.1.

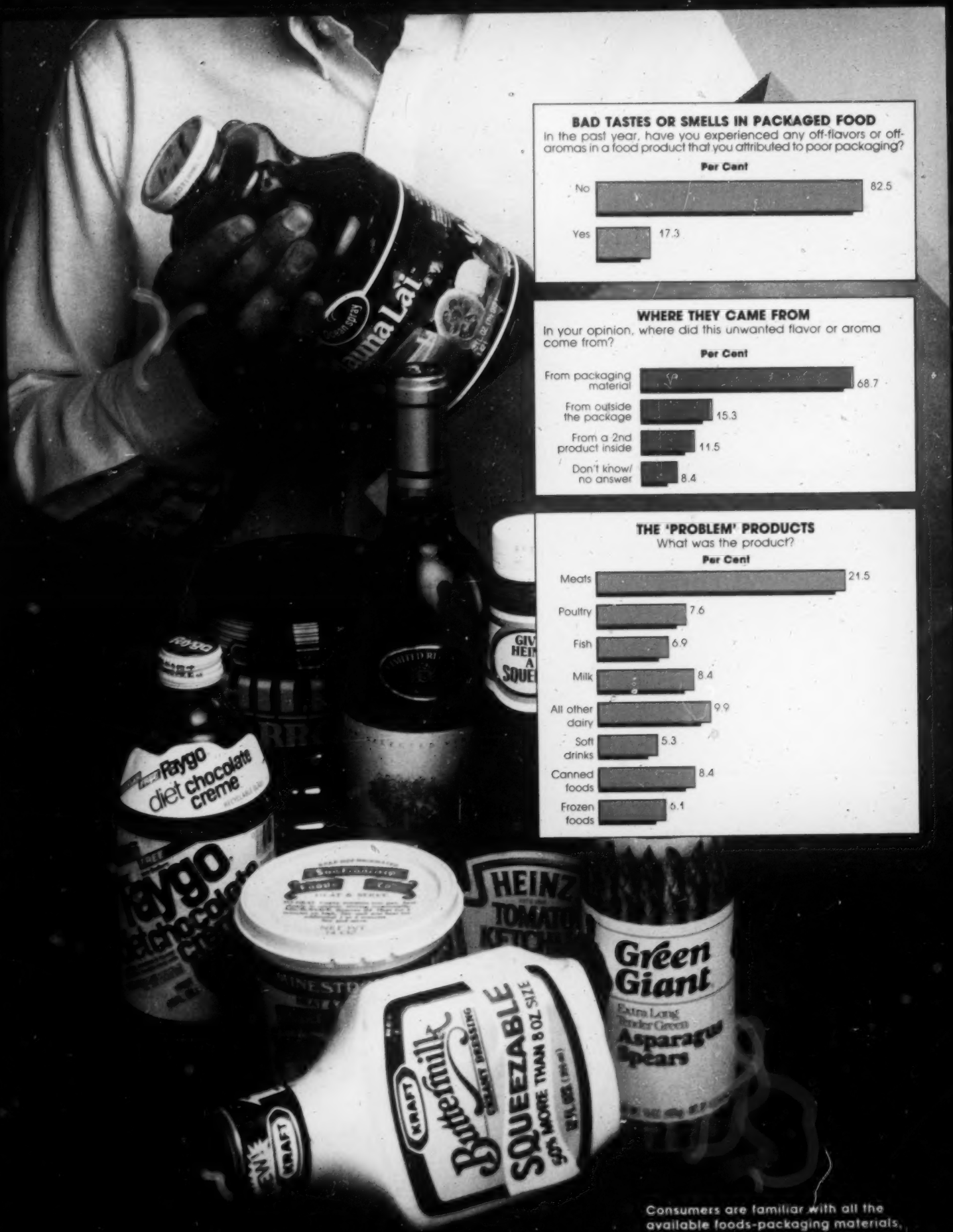
How much more are consumers willing to pay for all this tamper-evident packaging? PACKAGING asked that question in 1986, 1987, and again in '88. Although the percentages have changed year to year, no pattern has emerged. The closest thing to







Tamper-evident packaging is still important to consumers, and they're willing to pay for it.



BAD TASTES OR SMELLS IN PACKAGED FOOD

In the past year, have you experienced any off-flavors or off-aromas in a food product that you attributed to poor packaging?

	Per Cent
No	82.5
Yes	17.3

WHERE THEY CAME FROM

In your opinion, where did this unwanted flavor or aroma come from?

	Per Cent
From packaging material	68.7
From outside the package	15.3
From a 2nd product inside	11.5
Don't know/ no answer	8.4

THE 'PROBLEM' PRODUCTS

What was the product?

	Per Cent
Meats	21.5
Poultry	7.6
Fish	6.9
Milk	8.4
All other dairy	9.9
Soft drinks	5.3
Canned foods	8.4
Frozen foods	6.1

Consumers are familiar with all the available foods-packaging materials, and they know what they like.

17%

experienced off-flavors and off-aromas in poorly packaged food

a trend is this: The percentage of consumers who said they were willing to pay an additional 11-15 cents for tamper-evident packaging has more than doubled to nearly 16 for pharmaceuticals and has risen from 4.9 to 6.7 for food.

The 1988 survey also included questions about shelf-stable cooked meat and irradiated foods.

One of them was, "If precooked meat could be packaged without preservatives so that you could store it outside the refrigerator for a week, would you buy it?" The responses were: definitely would, 11.1 per cent; probably would, 16.9; might or might not, 38.0; probably would not, 19.2; definitely would not, 14.2.

Another question was, "How likely would you be to try a food product that had been irradiated to preserve freshness?" The largest percentage of the respondents—38.2—said they probably or definitely would not try it. Slightly more than 37 per cent said they were undecided, and 22.6 per cent said they probably or definitely would try irradiated food.

Also part of the 1988 questionnaire—as well as the 1987 one—was a series of inquiries about squeeze bottles for foods.

The percentage of consumers who said they had purchased ketchup, mayonnaise, jelly, or salad dressing in squeeze bottles increased overall 1987-88—led by a jump for ketchup of 13.9 and one for salad dressing of 11.4. For all foods except salad dressing, the percentage of squeezables purchasers in the 65-plus age group was the lowest; for all products except jelly, the percentage in the under-25 group was highest.

The 136 consumers who said they had not purchased any food products in squeeze bottles explained why by checking one or more reasons listed on the questionnaire. Almost 70 per cent marked "I like glass better," 33.8 per cent checked 'they are expensive," and 14.7 per cent chose "haven't seen them." Last year, the per cent that chose "haven't seen them" was 21.2.

Only 17.3 per cent of the 756 survey respondents said they had experienced off-flavors or off-aromas in foods that had been packaged poorly. PACKAGING asked those 131 consumers where they thought the unwanted taste or odor had come from. Almost 69 per cent of them said it had come from the packaging material itself; 15.3 per cent said it had come from something outside the package; 11.5 per cent said it had come from one product packaged inside another.

Asked to write in the type of "problem" product, more than 20 per cent of those 131 respondents wrote in meat; 9.9 per cent wrote in dairy products other than milk. Less than 9 per cent listed any of the following: milk, canned goods, poultry, fish, frozen foods, soft drinks.

PACKAGING also asked consumers to rate various aspects of food labels. The characteristics listed on the questionnaire and the percentages of consumers rating them "excellent/good" were: listing of ingredients, 83.7; directions for product preparation, 74.6; nutrition information, 62.7; accuracy of photo with respect to the product, 38.1; information about additives, 36.1.

Interest in recycling

Considering that the role of post-consumer packaging in waste-management problems is being closely scrutinized, PACKAGING allocated nearly a full page of the four-page questionnaire to recycling for 1988.

One of the questions PACKAGING asked in '88 has been part of the questionnaire for three consecutive years: "How important is recycling to you?" Each time, about 30 per cent of the respondents said recycling was "extremely important" to them, roughly 50 per cent said it was "somewhat important," about 15 per cent said it was "not very important," and 3 per cent said it was "not at all important."

However, between 1986 and 1988, the percentage of consumers who said that they "often" considered the recyclability of packaging materials when making a product-purchase decision rose from 8.7 to 15.2. The percentage that reported they "sometimes" considered it also rose —from 27.5 to 33.2 per cent.

Consumer perception of the ease with which various packaging materials can be recycled may affect purchasing decisions. Here are the materials listed in PACKAGING's questionnaire and the percentages of consumers who called them "very easy/easy" to recycle: aluminum, 83.9; paper, 75.0; glass, 55.4; steel, 40.5; plastics, 37.3.

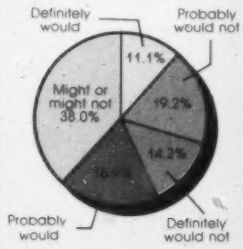
PACKAGING also asked consumers to rate manufacturers of packaging materials on how good a job the manufacturers were doing in recycling their materials. Aluminum companies received "very good/good" ratings from 73.7 per cent of the respondents; paper manufacturers got that rating from 52.9 per cent; glass companies received 46.6 per cent; steel makers got 29.9 per cent; plastics companies garnered 25.4 per cent.

Recycling funds

Who should fund new recycling programs? It's a sticky question. In the end, consumers will no doubt have to contribute, but PACKAGING didn't give them a chance to volunteer. Instead, the questionnaire listed only four choices and got these responses: private trash-collection agencies, 11.9 per cent; local, state, or federal governments, 20.6 per cent; manufacturers of the packaged products, 25.3; manufactur-

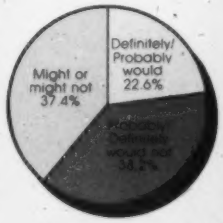
WHO WOULD BUY SHELF-STABLE COOKED MEAT?

If precooked meat could be packaged without preservatives so that you could store it unopened outside the refrigerator for a week, would you buy it?



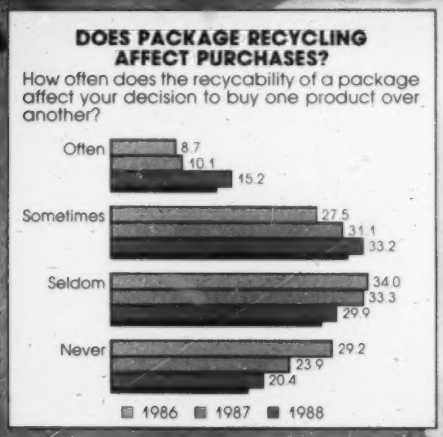
WHO WOULD TRY IRRADIATED FOOD?

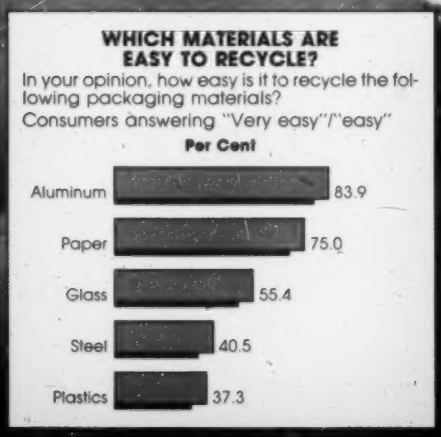
How likely would you be to try a food product that had been irradiated to preserve freshness?



FOODS PURCHASED IN SQUEEZE BOTTLES

Please indicate if you have ever purchased any of these products packaged in plastic squeeze bottles.





Which material is easiest to recycle? Consumers have a good idea and rely on it when selecting containers.

79%

of consumers aged 65-plus would sort their trash for recycling

ers of the packaging materials, 36.8.

PACKAGING also asked consumers where all the discarded packaging should go and offered only two choices: "Bury it in public landfills," or "Burn it in public incinerators." More than 19 per cent of the respondents from the Northeast, 25.8 per cent from the North Central region, 36.6 per cent from the South, and 41.7 per cent from the West voted for landfilling. Incineration was favored by 77.6 per cent of the respondents from the Northeast, 68.4 per cent from the North Central region, 59.5 per cent from the South, and 52.8 per cent from the West.

Many environmentalists see consumer sorting of used packaging materials for curbside pickup and recycling as a way to reduce the volume of waste that must be either dumped or burned. PACKAGING's 1988 Consumer Survey revealed that willingness to do this ran high generally, though it differed among age groups.

Less than 66 per cent of respondents under 25 years of age said they would sort their trash to remove recyclable packaging materials; 72.4 per cent of those aged 25-44 said they would; 76.4 per cent of those 45-64 would do so, and 78.9 per cent aged 65 or over would.

Regional differences were apparent, too. The smallest percentage of consumers willing to sort—69.5—came from the North Central region. The largest percentage—81.9—came from the West.

A controversial means of removing recyclable used packaging from the waste stream is the beverage-container deposit law or "bottle bill." PACKAGING isolated those consumers who lived in states that did not have bottle bills and asked them whether they would support deposits on nonrefillable soft-drink and beer containers. The percentage of "yes" responses varied by region: 62.7 from the Northeast, 61.5 from the West, 43.4 from the North Central region, and 39.3 from the South.

It is conceivable that such deposits could be placed on all other containers including soup cans, milk bottles, and pickle jars. Did the consumers feel such a law would be a good idea? Across all age and lifestyle groups, the ratio of no to yes votes was approximately two to one. However, more than 40 per cent of the young singles said they would support a law requiring deposits on all other containers made of metal, glass, and plastic. The highest percentage of no votes—79.8—came from the middle-age parents group. ■

FOR MORE INFORMATION

Information contained in this article was condensed from more than 400 pages of data in the 1988 Consumer Survey. The complete study contains answers to 44 questions related to packaging. It is available for $175. For more information, contact Consumer Survey Editor, PACKAGING magazine, Cahners Publishing Co., 1350 E. Touhy Ave., Des Plaines, Ill. 60018, or circle No. **478** on the Reader Service Card.

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Oustanding	479
Above Average	480
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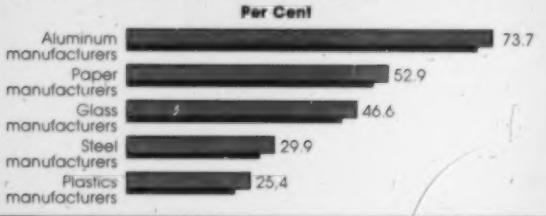
GREG ERICKSON
Senior Editor

"It's clear from the results of this survey that American consumers are perceptive and discerning. Their opinions are something that all professionals in the packaging industry ought to consider."

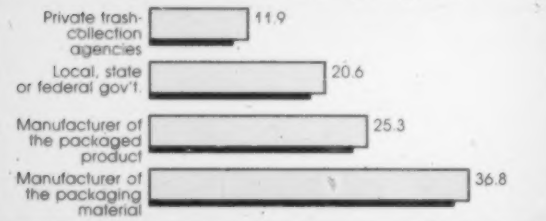
WHO'S DOING A GOOD JOB WITH RECYCLING?

In your opinion, how good a job of recycling packaging materials are the following companies doing?
Consumers answering "Very good"/"good"



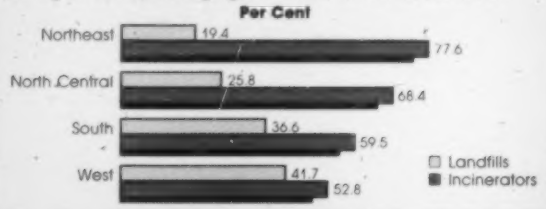
WHO SHOULD PAY FOR RECYCLING?

Who should fund new recycling programs?



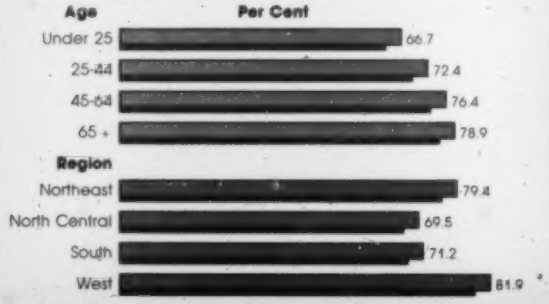
WHERE SHOULD THE TRASH GO?

If you had to choose only one of the following methods of disposing of used packaging materials, which would it be?



WHO WILL SORT USED PACKAGES FOR RECYCLING?

Are you willing to separate used packaging materials by type—paper, metal, glass, plastic—for curbside collection?



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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/JULY 1988

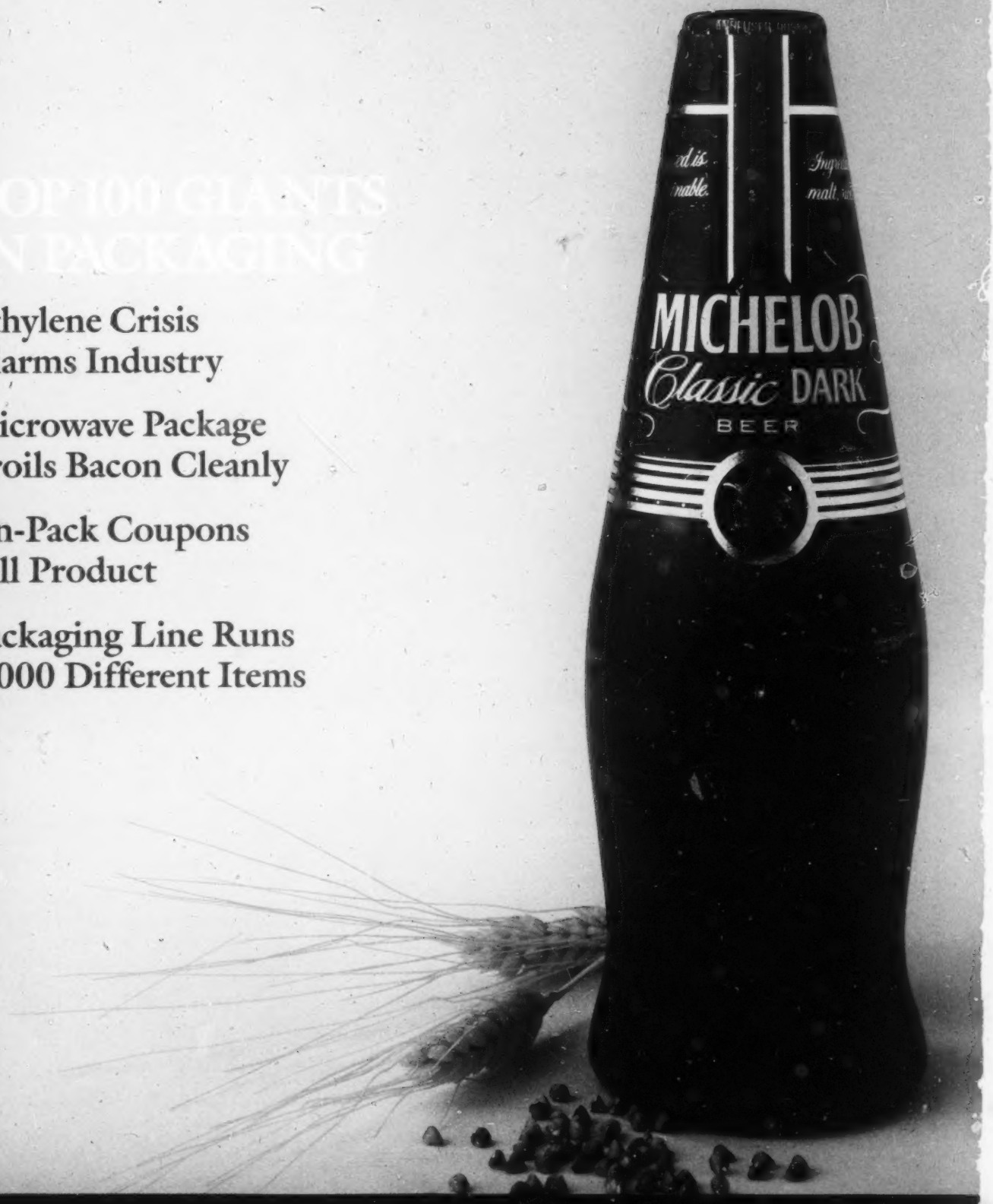
TOP 100 GIANTS IN PACKAGING

Ethylene Crisis Alarms Industry

Microwave Package Broils Bacon Cleanly

On-Pack Coupons Sell Product

Packaging Line Runs 3,000 Different Items



CONTENTS

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A CAHNERS PUBLICATION VOLUME 33 NUMBER 9

PACKAGING NEWS

Ethylene crisis alarms industry 8
Plastics companies' allocation programs force converters and extruders to postpone expansion

Colorful corrugated box boosts Aquatank's aquarium sales 14

Graphics help establish gourmet breakfasts in freezer section 15

Tropicana Twister debuts in easy-to-grip, glass bottles 16

PACKAGING FEATURES

SPECIAL REPORT

Top 100 Giants in Packaging 38
Which companies spent the most on packaging materials and finished containers in 1987?

STATE OF THE ART

On-package coupons sell product 50
P-S labeling isn't just for prime decoration anymore—instant redemption coupons are a cost-effective use

PACKAGING OPERATIONS

Plant of the Month: Line runs 3,000 different items 58
The volume stays up, the defects are down and crew output is tops

MARKETING

Plastic film sweetens sales 70
Even the smallest candy makers use plastic packaging to attract new fans and save money

Downsized packages fit small markets 77
Maker of crackers and cookies adds two product lines for convenience stores

PACKAGING TECHNOLOGY

Microwave packet broils bacon cleanly 80
Package has plastic film that inflates with steam while an absorbent pad soaks up grease

Motion-analyzer helps increase productivity, minimizes waste 94

Oriented PP film lends optimum graphic appeal for pasta-maker 104

Seal-free pump cuts downtime in chemical drum packaging 113

DEPARTMENTS

EDITORIAL	3	NEW EQUIPMENT	84	ADVERTISERS INDEX	122
PEOPLE	26	NEW MATERIALS	97	WRAP UP	122
ASSOCIATION NEWS	28	CLASSIFIED	115	READER SERVICE CARD	123

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What's The Best Package Material?

Recycling proponent says it's plastic

The way Wayne E. Pearson figures it, plastic is the perfect packaging material for this age of growing concern about the environment. Pearson, executive director of the Plastics Recycling Foundation, visited PACKAGING magazine recently with E. Allen Polka of Soltex Polymer Corp. to discuss plastics recycling. Their entire presentation can be summed up best by Pearson's definition of "ideal" packaging.

"It should be recyclable," he said, "and plastics are being recycled. But if the material is not recycled, you don't want it to decompose in a landfill. If you're not going to send it to a landfill, you want to incinerate it without any ash. And you can incinerate plastics without any ash." He added, "If the public understood this, instead of banning plastics they would be demanding that plastics be used."

Comingled plastics plus fragments of paper and aluminum make up the chunk of lumberlike material displayed by E. Allen Polka of Soltex Polymer Corp. (left) and Wayne E. Pearson of the Plastics Recycling Foundation.

Pearson acknowledged that although consumers appear ready and willing to separate used plastic containers from nonrecyclable materials, they remain skeptical of incineration. Polyethylene, polyvinyl chloride, and polyethylene terephthalate, he said, "burn perfectly at 19,000 BTU per pound to produce carbon dioxide and water and nothing else unless you have added a pigment." Neverthless, he added, "That's not the public's perception of how to deal with this unbelievably complex issue of solid-waste management."

Pearson and Polka illustrated one alternative to incineration with a sample of extruded lumberlike material made from comingled plastics, fragments of paper labels, and ground-up bits of aluminum from drop-ring closures. Pearson said, "The value of this stuff overseas is incredible. It will find great use in China, for example." He said he believed Asia would soon become a highly important market for post-consumer plastic containers —the raw material from which such wood substitutes are made.

The Plastics Recycling Foundation has prepared a report titled *Plastics Recycling: A Strategic Vision*. For information, contact the group at 1275 K St., Washington, D.C. 20005.

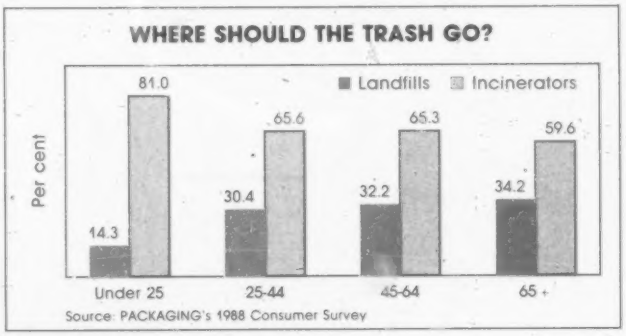
Companies Unite To Tout Paperboard

Environmental benefits stressed

As president of the newly formed Pro-Environment Packaging (PEP) Council, Samuel Posner will be promoting the ecological benefits of paperboard. Members of the New York City-based group now comprise Champion International, Georgia-Pacific, Gaylord Container, International Paper, the Newark Group, Stone Container, Union Camp.

Posner said the PEP Council will be talking up the fact that some paperboard packaging is fully biodegradable and that even plastic-coated paperboard is partially degradable.

"Where there are landfills," Posner said, "isn't it more beneficial to have coated paperboard there than polystyrene or PVC? My guess is that it's better to have something that biodegrades instead of something that will be there forever."



Incineration Opinions Vary By Age Group

Youngest consumers like it most of all

As part of PACKAGING magazine's fourth annual Consumer Survey, consumers were asked to state their preference for either landfills or incineration as a means of trash disposal. Overall, support for incineration ran higher than that for landfills.

Responses differed significantly by age group. As shown on the accompanying chart, consumers in the Under 25 age group said they preferred incineration over landfilling by a margin of 67 percentage points. Among consumers in each of the other age groups, however, the margin fell to only about 30 points.

The survey was sent to 1,000 households nationwide in early 1988. A detailed report on information supplied by the 756 respondents appeared in PACKAGING's June issue.

California Eateries Recycle Glass

Phoenix Project participation grows

More than 1,000 restaurants, bars, and hotels throughout California are recycling glass every day as participants in the Phoenix Project, sponsored by the California Glass Recycling Corp.

The businesses receive at least $20 a ton for their used glass bottles and jars, which helps defray their operating costs. Beyond that, some of the establishments are donating revenue from the recycled glass to charities.

Local recyclers provide bins, pick up the glass, and keep the bin areas clean. The CGRC provides worksheets so the establishments can calculate how much glass they generate monthly and assists them in preparing press releases promoting their participation in the project.

For more information, contact the CGRC at 1225 Eighth St., Suite 590, Sacramento, Calif. 95814.

SPECIAL REPORT

TOP 100 PACKAGING GIANTS

Which companies spent the most on packaging materials and containers for 1987? In this exclusive report, PACKAGING presents the data

By Mark Spaulding Associate Editor

The 100 U.S. companies listed in this year's Packaging Giants report are a formidable force in the American marketplace. Together, these firms sold more than $525.7 billion of packaged goods to U.S. consumers. Their share of the gross national product has an equally important impact on the domestic packaging industry.

Our exclusive list of the Top 100 Packaging Giants consumed more than $18.84 billion worth of materials and finished containers last year. That's more than 31 per cent of the total estimated U.S. packaging industry in 1987. To put it into a sharper focus, the Giants spent more than $72 million each business day. Anheuser-Busch, our No. 1-ranked company, alone spends about $8 million per business day.

Clearly, the nation's largest consumers of packaging materials and containers sell a cornucopia of products . . . from food and pharmaceuticals to cosmetics, cars

and computers. But which exactly are the companies that spent the most money on packaging in 1987?

How the survey was done

For the answers to our second annual Packaging Giants survey, we compiled data ranging from the U.S. Department of Commerce, our Cahners Economics division, corporate annual reports, the Fortune 500, and the packagers themselves. Sales from international operations have been eliminated, but the value of self-manufactured containers has been added. Domestic sales for each type of product were multiplied by an accurate percentage typically spent to package such products. The result is the most comprehensive listing available of packaging expenditures by major American consumer-goods companies. ■

Nine of the top 10 packaging consumers are major food and beverage firms such as Anheuser-Busch, RJR Nabisco, Philip-Morris and Kraft.

Rank	Company (location)	$ Spent on Packaging
1	Anheuser-Busch (St. Louis, MO)	$2,100,000,000
	Major Brands: Budweiser, Bud Light, Busch, Michelob, Natural Light, L.A., Carlsberg, Colonial, Earth Grains, Eagle	
2	Philip-Morris (New York, NY)	$1,777,189,000
	Major Brands: Marlboro, Miller, High Life, Lite, Genuine Draft, General Foods, Jell-O, Maxwell House, Oscar Mayer, Entenmann's, Post, Birds Eye	
3	RJR Nabisco (Atlanta, GA)	$1,120,000,000
	Major Brands: Winston, Salem, More, Now, Camel, Nabisco, Del Monte, Planters, Lifesavers, Oreo, Baby Ruth, Butterfinger, Ortega, Fleishmann's, Grey Poupon, Ritz, A.1., Triscuit, Comet, Easy Cheese, Care-Free, Blue Bonnet, Chun King, Milk Bone, Regina, Hawaiian Punch	
4	Procter & Gamble (Cincinnati, OH)	$731,972,700
	Major Brands: Tide, Bounce, Downy, Cheer, Joy, Ivory, Spin and Span, Mr. Clean, Comet, Jif, Crisco, Duncan Hines, Crush, Folger's Charmin, Pampers, Luvs, Oil of Olay, Zest, Lava, Sure, Secret, Vidal Sassoon, Pantene, Crest, Gleem, Scope, Nyquil, Vicks, Pepto-Bismol, Bain de Soleil, Always, Bounty, Citrus Hill, Pert Plus	
5	Pepsico (Purchase, NY)	$672,602,000
	Major Brands: Pepsi, Diet Pepsi, Mountain Dew, 7UP, Diet 7UP, Cherry 7UP, Slice, Fritos, Cheetos, Doritos, Tostitos, Lay's, Ruffles, O'Grady's	
6	Coca-Cola (Atlanta, GA)	$531,760,000
	Major Brands: Coke, Coca-Cola Classic, Diet Coke, Sprite, Diet Sprite, Tab, Minute Maid, Bacardi, Hi-C	
7	Kraft (Glenview, IL)	$529,440,000
	Major Brands: Kraft, Velveeta, Philadelphia Brand, Polly-O, Maybud, Parkay, Seven Seas, Lender's, Tombstone, Budget Gourmet, Breakstone, Breyers', Knudsen, Sealtest, Frusen Gladje, Mrs. Tucker's, Light n'Lively, Miracle Whip, Duracell	
8	Sara Lee (Deerfield, IL)	$425,000,000
	Major Brands: Sara Lee, Jimmy Dean, Hillshire Farm, Mr. Turkey, Kiwi, Chef Pierre, Fuller Brush, Hanes, L'eggs, Coach, Aris-Isotoner	

Top 10 food packagers consumed more than $8.5 billion on packaging

Rank	Company (location)	$ Spent on Packaging
9	**Kimberly-Clark** (Dallas, TX) **Major Brands:** Kleenex, Kotex, New Freedom, Huggies, Depend	$361,264,400
10	**Campbell Soup** (Camden, NJ) **Major Brands:** Campbell's, Swanson, Vlasic, Pepperidge Farm, Mrs. Paul's, Prego, Le Menu, Franco-American, Juice Bowl, V8	$332,544,764
11	**ConAgra** (Omaha, NE) **Major Brands:** Armour, Banquet, Morton, Taste O'Sea, Singleton, Country Pride, Peavey, Jack Rabbit, Cropmate	$325,028,907
12	**Joseph E. Seagram & Sons** (New York, NY) **Major Brands:** Seagram's, House of Seagram, Golden Spirits Coolers, Mumm Cordon Rouge, Chateau & Estate, Paul Masson	$324,624,000
13	**Avon Products** (New York, NY) **Major Brands:** Avon, Mediplex, Infusioncare, Foster's	$322,000,000
14	**Adolph Coors** (Golden, CO) **Major Brands:** Coor's, Coor's Light, Coor's Extra Gold, George Killian's, Herman Joseph's	$312,150,000
15	**Borden** (New York, NY) **Major Brands:** Borden, Eagle, Meadow Gold, Lite-Line, Wise, Jays, Soup Starter, Mrs. Grass, Creamettes, Cracker-Jack, Krylon, Elmer's, Rain Dance	$305,383,000
16	**G. Heileman** (LaCrosse, WI) **Major Brands:** Old Style, Special Export, Blatz, Colt 45, Champale	$295,128,000
17	**Scott Paper** (Philadelphia, PA) **Major Brands:** Scotties, ScottCloth, ScotTowels, ScotTissue, Baby Fresh, Sani-Tuff, Cottonelle, Softkins, Wyp-All	$274,927,000
18	**Pillsbury** (Minneapolis, MN) **Major Brands:** Pillsbury, Totino's, Jeno's, Chef Saluto, Green Giant, French's, Haagen-Daz, Van de Kamp's	$265,000,000
19	**General Mills** (Minneapolis, MN) **Major Brands:** Wheaties, Cheerios, Total, Fiber One, Betty Crocker, Gold Medal, Bisquick, Hamburger Helper, Pop Secret, Yoplait, Gorton's, Fruit Corners	$251,000,000
20	**Sterling Drug** (New York, NY) **Major Brands:** Bayer, Panadol, Stri-Dex, Phillips' Milk of Magnesia, Neo-Synephrine, Midol, pHisoDerm, Lysol, Love My Carpet, d-Con, Minwax, Thompson's, Formby's, Ogilvie, Wet Ones, Omnipaque, Inocor, Danocrine, Carpuject	$250,000,000
21	**Brown-Forman** (Louisville, KY) **Major Brands:** Jack Daniel's, Canadian Mist, California Cooler, Southern Comfort, Korbel, Cella, Bolla, Martell, Lenox, ArtCarved, Hartmann	$249,094,000
22	**IC Industries** (Chicago, IL) **Major Brands:** Pepsi-Cola General Bottlers, Pet, Progresso, B&M, Whitman's, Old El Paso, Downy-Flake	$239,612,000

Rank	Company (location)	$ Spent on Packaging
23	**Georgia-Pacific** (Atlanta, GA) **Major Brands:** Georgia-Pacific, Coralure, Dens-Glass, Dens-Shield, Summit, Coronet, Delta, Mr. Big, Big 'N Thirsty, Big 'N Soft, Big 'N Pretty, Angel Soft, Sparkle	$236,527,000
24	**Revlon** (New York, NY) **Major Brands:** Max Factor, Almay, Charles of the Ritz, Jean Nate, Krystal, Monteil, Von Furstenburg	$234,476,000
25	**H.J. Heinz** (Pittsburgh, PA) **Major Brands:** Heinz, Star-Kist, Ore-Ida, Weight Watchers, 9-Lives	$229,051,085
26	**Colgate-Palmolive** (New York, NY) **Major Brands:** Colgate, Palmolive, Ajax, Curity, Hill's, Irish Spring	$225,300,000
27	**Beatrice** (Chicago, IL) **Major Brands:** Beatrice, Hunt's, Wesson, Tropicana, Orville Redenbacher, Swift, Eckrich, County Line, Martha White, Aunt Nellie's, Lowrey's	$216,351,000

Rank	Company (location)	$ Spent on Packaging
28	**American Home Products** (New York, NY) **Major Brands:** Advil, Anacin, Dristan, Riopan Plus, Denorex, Preparation H, Chef Boy-ar-dee, Mamma Leone's, Jiffy Pop, Pam, Woolite, Easy-Off, Black Flag	$205,000,000
29	**Quaker Oats** (Chicago, IL) **Major Brands:** Quaker, Aunt Jemima, Gatorade, Ken-L Ration, Gaines Burger, Golden Grain, Kretschmer, Van Camp's, Ardmore Farms, Fisher-Price	$181,257,180
30	**E.I. DuPont de Nemours** (Wilmington, DE) **Major Brands:** Teflon, Stainmaster, Selar, Corian, Silverstone, Conoco	$167,925,000
31	**General Cinema** (Chestnut Hill, MA) **Major Brands:** Pepsi-Cola, Dr. Pepper, 7-Up	$161,394,000
32	**Clorox** (Oakland, CA) **Major Brands:** Clorox, Formula 409, Litter Green, Kingsford, Olympic, Hidden Valley Ranch, Moore's, Domani, Prince Castle, Liquid-plumr, Soft Scrub, Tilex	$160,000,000
33	**Johnson & Johnson** (New Brunswick, NJ) **Major Brands:** Johnson's, Band-Aid, StayFree, Sure & Natural, Act, Ortho-Novum	$158,645,000
34	**General Motors** (Detroit, MI) **Major Brands:** Chevrolet, Pontiac, Oldsmobile, Buick, Cadillac, GMC, GM parts	$153,000,000
35	**CPC International** (Englewood Cliffs, NJ) **Major Brands:** Hellman's, Best Foods, Karo, Skippy, Knorr, Thomas', Mazola, Mueller's, Arnold, Argo, Brownberry, Old London	$151,000,000
36	**Lever Brothers** (New York, NY) **Major Brands:** All, Wisk, Snuggle, Sun Light, Surf, Final Touch, Imperial, Dove, Caress, Mrs. Butterworth's	$150,976,600

LEADING HOUSEHOLD-PRODUCT PACKAGERS

RANK	COMPANY	GIANTS RANKS
1	Procter & Gamble	4
2	American Home Products	28
3	Clorox	32
4	Lever Brothers	36
5	3M Co.	47

Household products, from major players such as P&G, Clorox, Dow Chemical and Miles Labs, accounted for 7 per cent of the Giants' packaging expenditures.

Top 100 spent over $72 million on packaging each business day

LEADING COSMETICS PACKAGERS

RANK	COMPANY	GIANTS RANK
1	Avon Products	13
2	Revlon	24
3	Faberge	70
4	Noxell	78
5	Gillette	91

Cosmetics rang up more than $675 million in packaging purchases last year by the top five firms.

LEADING PHARMACEUTICAL PACKAGERS

RANK	COMPANY	GIANTS RANK
1	Sterling Drug	20
2	American Home Products	28
3	Johnson & Johnson	33
4	Bristol-Myers	48
5	Pfizer	58

Rank	Company (location)	$ Spent on Packaging
37	**Thomas J. Lipton** (Englewood Cliffs, NJ) **Major Brands:** Lipton, Cup-a-Soup, Wish-Bone, Good Humor, Wyler's, FruitSlush, Lawry's, Knox, Sunkist FunFruits, Flavor Tree	$140,000,000
38	**Hershey Foods** (Hershey, PA) **Major Brands:** Hershey's, Reese's, New Trail, Golden, Luden's, Y&S, American Beauty, San Giorgio, Skinner	$132,380,486
39	**Geo. A. Hormel** (Austin, MN) **Major Brands:** Hormel, Black Label, Cure 81, Dinty Moore, Farm Fresh, Frank 'N Stuff, Jennie-O, Little Sizzlers, Mary Kitchen, New Traditions, Spam, Top Shelf, Wranglers	$132,180,000
40	**Ralston-Purina** (St. Louis, MO) **Major Brands:** Ralston, Purina, Hostess, Wonder, Eveready, Energizer	$122,949,000
41	**The Dial Corp.** (Phoenix, AZ) **Major Brands:** Dial, Tone, Pure & Natural, Purex, Trend, Fels, La-France, Brillo, SnoBol, Old Dutch, Cameo, Magic Sizing, Bruce, Lunch Buckets, Ellio's, Appian Way	$121,671,300
42	**General Electric** (Fairfield, CT) **Major Brands:** GE, Hotpoint, RCA, Lexan	$120,000,000
43	**Kellogg** (Battle Creek, MI) **Major Brands:** Kellogg's, Eggo, Pop-Tarts, Mrs. Smith's, Salada, Whitney's	$119,802,600
44	**Ocean Spray Cranberries** (Plymouth, MA) **Major Brands:** Ocean Spray, Firehouse, Mist Kist, Mystic Farms, No-Thaw, Spoonables, River Sweet, Sunfruit	$117,728,000
45	**M&M/Mars** (Hackettstown, NJ) **Major Brands:** M&Ms, Snickers, Three Musketeers, Milky Way, Twix, Combos	$116,494,000

Pharmaceutical companies whose reputations are built around over-the-counter drugs spent the most on packaging materials and containers in this category.

Rank	Company (location)	$ Spent on Packaging
46	**Occidental Petroleum** (Los Angeles, CA) **Major Brands:** IBP Fresh Beef and Pork	$115,400,000
47	**3M Co.** (St. Paul, MN) **Major Brands:** Scotch, Scotchgard, Post-it, Soft-Scour	$112,718,000
48	**Bristol-Myers** (New York, NY) **Major Brands:** Nuprin, Bufferin, Excedrin, Datril, Comtrex, Ban, Vitalis, No Doz, Windex, Drano, Vanish, O-Cedar, Endust, Clairol, Sea Breeze, PreSun, Keri, Enfamil	$111,772,300
49	**Dow Chemical USA** (Midland, MI) **Major Brands:** Cepacol, Saran Wrap, Handi-Wrap, Ziploc, Spray'n Wash, Texize, Yes, Glass Plus, Tough Act	$110,000,000
50	**Ford Motor Co.** (Greenfield, MI) **Major Brands:** Ford, Lincoln-Mercury, Merkur, Motorcraft	$107,800,000
51	**International Business Machines** (Armonk, NY) **Major Brands:** IBM	$99,748,000
52	**Westinghouse** (Pittsburgh, PA) **Major Brands:** ThermoKing, Longines-Wittenauer, Royal Crown Bottling	$89,134,900
53	**Boise Cascade** (Boise, ID) **Major Brands:** Boise Cascade, Mega	$89,117,000
54	**Eastman Kodak** (Rochester, NY) **Major Brands:** Kodak, Eastman, Kodachrome, Ektachrome, Ektapro	$85,112,000
55	**American Brands** (Old Greenwich, CT) **Major Brands:** Tareyton, Pall Mall, Carlton, Lucky Strike, Jim Beam, Windsor Canadian, Gibley's Gin, Acco, Wilson Jones, Master Lock, Titleist, Prestige, Swingline	$85,069,900
56	**PPG Industries** (Pittsburgh, PA) **Major Brands:** Pittsburgh Paints	$85,000,000
57	**Texaco** (White Plains, NY) **Major Brands:** Texaco, Havoline Supreme	$83,102,300
58	**Pfizer** (New York, NY) **Major Brands:** Feldene, Procardia, Cefobid, Ben-Gay, Barbasol	$80,148,000
59	**Tyson Foods** (Springdale, AR) **Major Brands:** Tyson, Chick'N Quick, Originals, Country Fresh, Mexican Originals, International Entrees	$80,000,000
60	**Dean Foods** (Franklin Park, IL) **Major Brands:** Dean, Reiter, McArthur, T.G. Lee, McCadam, Yankee Brand, Chateaugay, Larsen, Freshlike, Veg-All, Peter Piper, Hoffman House, Pudding Plus, Mrs. Weaver's Salads, Juice Services, Sun Flo	$77,338,300
61	**United Brands** (Cincinnati, OH) **Major Brands:** Chiquita, John Morrell, Rath Black Hawk	$70,858,000
62	**Land O'Lakes** (Minneapolis, MN) **Major Brands:** Land O'Lakes, Cenex, Lake to Lake, Alex Fries	$70,000,000
63	**Tenneco** (Houston, TX) **Major Brands:** Tenneco, Walker, Monroe, Ekco, EZ Por, Case IH	$69,000,000
64	**Mobil Oil** (New York, NY) **Major Brands:** Mobil, Mobil 1, Hefty, Cinch Sak, Lustra	$64,000,000
65	**Chevron** (San Francisco, CA) **Major Brands:** Chevron, Ethyl	$59,679,085
66	**Monsanto** (St. Louis, MO) **Major Brands:** Monsanto, Nutrasweet, Acrilan, Lasso, Wear Dated	$59,528,900

Petroleum firms spent $440 million to package resins and motor oils

Rank	Company (location)	$ Spent on Packaging
67	Amoco (Chicago, IL) **Major Brands:** Amoco	$57,297,500
68	Chrysler (Highland Park, MI) **Major Brands:** Chrysler-Plymouth, Dodge, Jeep-Eagle, Mopar	$54,324,000
69	Baxter International (Deerfield, IL) **Major Brands:** Baxter, Pharmaseal, Scientific Products, V. Mueller, Dade, Edwards, Bentley, Fenwal, Hyland, Microscan, Paramax, Exactech	$52,000,000
70	Faberge (New York, NY) **Major Brands:** Faberge, Organics	$51,236,000
71	Gerber Products (Fremont, MI **Major Brands:** Gerber, First Foods, Hankscraft, Nuk, Buster Brown, Weather Tamer, Century, Bilt-Rite, Nursery Originals, Nod-a-Way	$50,705,300
72	Morton-Thiokol (Chicago, IL) **Major Brands:** Morton, Windsor, System Saver, Safe-T-Salt, Adcote, Polybond, Dynalith, Morfast, Automate, Oilsol, Culinox 999	$50,000,000
73	Shell Oil (Houston, TX) **Major Brands:** Shell, Fire and Ice 2000	$49,800,000
74	Standard Oil (Cleveland, OH) **Major Brands:** Standard, Gulf, Barex	$48,404,200
75	Merck & Co. (Rahway, NJ) **Major Brands:** Vasotec, Primaxin, Norozin, Pepcid, Ivermectin	$46,766,300
76	Miles Laboratories (Elkhart, IN) **Major Brands:** Alka-Seltzer, One-A-Day, Flintstones, Multistix, S.O.S. Glass Works, Within, Bactine, Maxion	$43,000,000

Rank	Company (location)	$ Spent on Packaging
77	SmithKline Beckman (Philadelphia, PA) **Major Brands:** Tagamet, Dyazine, Contac, Ecotrin, Soflens, Allergan's, Aquacare, Betagan	$42,500,000
78	Noxell (Hunt Valley, MD) **Major Brands:** Noxema, Cover Girl, Clarion, Lestoil	$40,580,000
79	North American Philips (New York, NY) **Major Brands:** Norelco, Magnavox, Sylvania, Genie, Schick	$39,500,000
80	NCR (Dayton, OH) **Major Brands:** NCR	$38,883,000
81	Olin Corp. (Stamford, CT) **Major Brands:** Olin, H-T-H, Pace, Sun, Winchester ammunition	$38,500,000
82	Whirlpool (Benton Harbor, MI) **Major Brands:** Whirlpool, Kenmore, Kitchenaid, Mastercraft	$37,797,500
83	Abbott Laboratories (North Chicago, IL) **Major Brands:** Pulmocare, Abbokinase, Erythrocin, Tranxene, Selsun Blue, Murine, Tronolane, Faultless	$37,324,000
84	Interstate Brands (Kansas City, MO) **Major Brands:** Dolly Madison, Butternut, Holsum, Deli Dan, Deli-Stop, Millbrook, Mrs. Cubbison's	$37,100,000
85	Champion International (Stamford, CT) **Major Brands:** Champion, Nationwide	$37,000,000
86	Wilson Foods (Oklahoma City, OK) **Major Brands:** Wilson, Corn King, TenderCuts, Fischer, Mellwood, Quickcut, Anderson, Toppers, Bake-Rite, Fryrite	$33,501,422
87	Corning Glass Works (Corning, NY) **Major Brands:** Corning Ware, Corelle, Visions, Pyrex, Storage Plus	$32,250,000

Personal-care products cost the Giants about $1.1 billion to package last year.

Rank	Company (location)	$ Spent on Packaging
88	**Goodyear Tire & Rubber** (Akron, OH) **Major Brands:** Goodyear	$32,000,000
89	**Atlantic Richfield** (Los Angeles, CA) **Major Brands:** ARCO	$31,067,600
90	**Emerson Electric** (St. Louis, MO) **Major Brands:** Emerson, White-Rodgers, Alco, Copeland, Skil, Liebert, Rosemount	$31,000,000
91	**Gillette** (Boston, MA) **Major Brands:** Gillete, Good News, Dry Idea, White Rain, Paper-Mate, Flair, Liquid Paper, Braun, Silkience, Mink Difference, The Dry Look	$30,000,000
92	**McCormick & Co.** (Hunt Valley, MD) **Major Brands:** McCormick, Schilling, Cake Mate, Pasta Prima, Gilroy, Stange, Gentry, Armanino Farms, Golden West, Setco	$29,868,000
93	**Phillips Petroleum** (Bartlesville, OK) **Major Brands:** Phillips 66, Marlex, K-Resin, Ryton, Phillips Fibers	$28,303,000
94	**Squibb** (Princeton, NJ) **Major Brands:** Capoten, Corgard, Acti-Derm I, Azactam, Isovue, Choletec, NovoPen	$27,804,868
95	**Rohm & Haas** (Philadelphia, PA) **Major Brands:** Plexiglas, Paraloid, Rhoplex, Primal, Kathon, Acrysol	$27,500,000
96	**Upjohn** (Kalamazoo, MI) **Major Brands:** Xanax, Halcion, Motrin	$27,200,600
97	**Masco** (Taylor, MI) **Major Brands:** Drexel, Heritage, Henredon, Dixie, Hickorycraft, La Barge, Delta, Epic, Weiser, Baldwin, Merillat, Fieldstone, Aqua Glass, Hot Spring, Thermador	$26,723,500
98	**Hasbro** (Pawtucket, RI) **Major Brands:** Hasbro, Playskool, Milton Bradley, G.I. Joe, My Little Pony, Transformers, Tinkertoys	$26,401,000
99	**Gold Kist** (Atlanta, GA) **Major Brands:** Gold Kist	$26,000,000
100	**Ashland Oil** (Somwhere, KY) **Major Brands:** Ashland, Valvoline	$25,866,000

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Average	462
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MARK SPAULDING
Associate Editor

"The impact of the packaging industry on the overall U.S. economy should not be underestimated . . . not when our Top 100 Giants alone spend more than $3 million every hour of every business day on materials and containers to get their products to market."

PLASTIC FILM SWEETENS SALES

Now even the smallest candy makers use plastic packaging to attract new fans and save money

By Greg Erickson
Senior Editor

A combination of new demographic ingredients makes the outlook for this $12 billion industry seem semisweet.

First of all, affection for candy runs deep in America: According to a study prepared for the National Confectioners Association, about 31 per cent of Americans said they bought and ate candy at least once a month; 56 per cent or more said they bought and ate candy at least once a week; 9 to 10 percent said they ate candy every day.

Also a positive sign as the NCA interprets it is a recent finding by a University of Southern California professor: The portion of the American population termed "affluent" has risen from roughly 5 per cent to as high as 18 per cent. Americans are likely to use candy to satisfy—as ads for a premium chocolate mint put it—their "urge to splurge."

There is, however, a hint of bitter in the mix:

Annual per capita consumption of confections in the U.S. stands at 19 pounds. That's the problem: It just stands there. No significant increase has occurred in the past three years.

New-product introductions in the confectionery field totaled 150 in 1986. Meanwhile, retail shelf space in the candy department has not grown.

And two other factors are changing the way confectioners market their products:

The U.S. birth rate is presently the lowest in our history, and the median age of the American population, now 32, will hit 40 by the end of the century.

Plastic takes over

Packaging is playing a big part in the confections industry. Paper and foil are rapidly being outmoded by plastic films—chiefly white opaque oriented polypropylene (OPP) and polyester. Barrier materials such as PVDC and metallized films are boosting shelf life. Excellent graphics and printing are attracting discerning eyes. Improved tamper-resistance is allaying fears.

Consumers can still find a few sweets packaged in paper and foil, but less and less often. Within the past few years, giants Mars, Hershey, and Nabisco have moved almost entirely to plastic film; smaller companies have followed. The consensus among representatives of packaging suppliers and converters interviewed by PACKAGING magazine is that when existing paper and foil machinery wears out, even the smallest candy companies will change over to plastics.

Neither biggest nor smallest is Boyer Bros., maker of Mallo Cup, Peanut Butter Cup, and Smoothie. A family-owned business until it was purchased by Consolidated Brands in 1984, Boyer had not drawn a great deal of attention to itself with its glassine packaging. But as this story was being written, Boyer was getting sort of flashy. Said Dave Koelle, purchasing director, "We're going to plastic now because we want to become more aggressive in our marketing." Boyer's plastic-clad line was scheduled to start appearing in stores midsummer.

Shelf life zooms

A big benefit will be longer shelf life. Koelle said he expected Boyer's new OPP wrappers to raise the shelf life of its confections from six to nine months. Other confectioners have reported a doubling of shelf life when they went from non-plastic to plastic packaging.

Making packages air-tight enough to keep candy fresh so long is easy when plastic films—either heat-sealed or cold-sealed—are used. Some of these wrappers are so tight they look like little balloons. A fringe benefit is that air trapped inside the puffy little packages serves as cushioning.

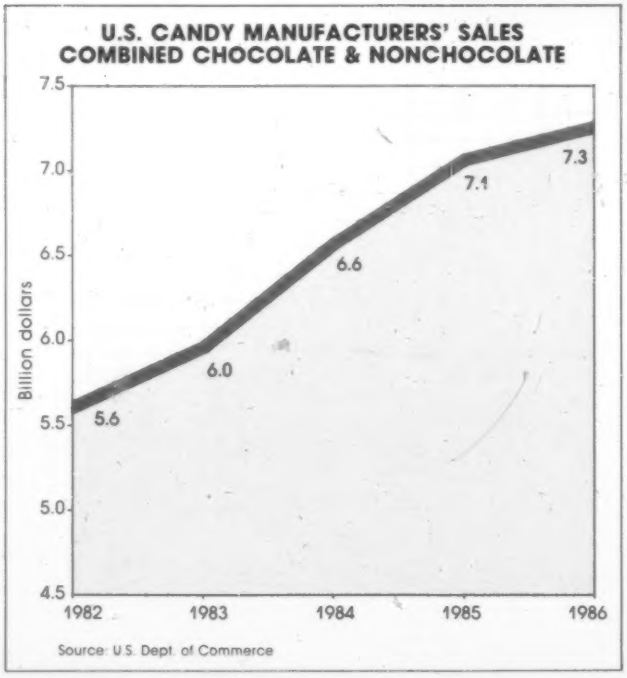
Chocolate bars may not exactly spoil, but eventually they can go stale and pick up unwanted odors. PVDC-coated polypropylene is one material being used to provide an aroma barrier.

A move to plastic packaging has helped candy makers put an end also to infestation, which one packaging machinery distributor said was a particularly serious problem for makers of chocolate bars that contain natural ingredi-

ents such as nuts and raisins. Said a converter, "Bugs can get through gaps in paper seals and even through pinholes in aluminum foil." Insects can gnaw through glassine but either can't or won't chew on polypropylene.

When PACKAGING magazine's 1988 Consumer Survey asked consumers which foods they felt should be available in tamper-evident packaging, more respondents selected candy than any other type of food. Plastic film, which seals securely, provides the tamper evidence that consumers want.

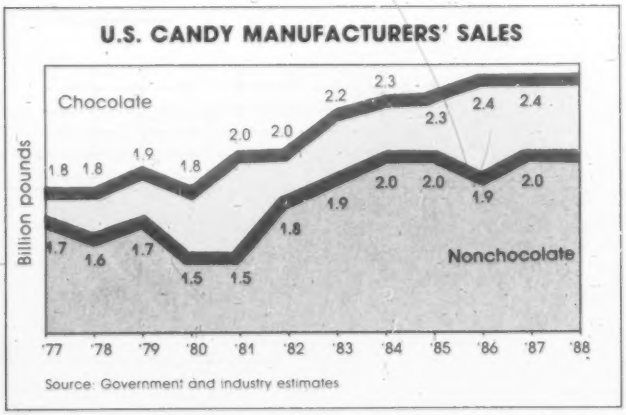
Few candies still are sold in unsealed packaging. A cookie-sized chocolate-covered mint loosely wrapped in a sheet of laminated paper foil looked highly susceptible until its maker moved to metallized film. Hershey's



One after another, candy bars are getting dressed up in plastic-film wrappers, which provide long shelf life. Another benefit is tamper evidence: Consumers must destroy the packaging to get at the goodies.

Plastic wrappers are so air-tight that they can do double-duty as cushioning

Brilliant colors, made possible by new plastic films, widen the eyes of consumers. The flash of metallized films also attracts attention while providing an excellent barrier.



Kisses—all 1,500 produced every minute of every day—are still individually dressed in aluminum foil, but recently they have become available at the candy counter packaged nine to a tamper-resistant metallized-film bag.

Candy moves upscale

There's still a market for venerable Pez candy, Necco wafers, and cherry licorice, and it's not what anyone would call "upscale." But that is an adjective being used to describe other candy aimed at the affluent adult.

Reverse-printed laminated film structures are giving candy packages the much-desired "wet look," which seems to speak to the adult consumer of high quality. Reflective wrappers are also desirable.

Some candy—most notably Cadbury's Caramello bar—makes the most of metallized polyester as a graphic element. And demetallized polyester bags feature brilliant spots of metallization against transparent areas through which the sweets can show off their delectable colors.

Other candy makers use metallization primarily as a barrier. The wrapper of Mars' Kudos granola bar, for example, is made of a metallized-film lamination. The consumer does not initially see the metal, since it is on the inside.

OPP and polyester films also afford superb print jobs. Said Koelle, "We're not going to change the package graphics, but we will be calling attention to our package through the stronger colors we're going to achieve with the plastic."

Candy makers are also using product photography on wrappers to tantalize the consumer. One excellent example is the Bun bar from Storck. Available since 1906, Bun had an identity problem. Because its size and shape did not follow traditional dimensions, said a converter, "People didn't recognize it as a candy bar until the company put a photograph of it on the package." The move from paper wrapping with no photo to plastic film with photography helped boost sales 57 per cent in one year.

Line speeds jump

Heated competition has brought about a war of inches and ounces. Said one industry observer, "When Hershey increased its bar size by 14 per cent without raising the price, the rest of the candy industry had to follow suit. The smaller companies got squeezed because they didn't have Hershey's efficiencies."

Confectioners are now engaged in an efficiency war, and cold-seal machinery is one of the weapons. "We've seen some of our customers go to cold seal and nearly double their line speed," said one converter. Cold sealing also solves the problem of heat damage to the candy.

Heat-seal speeds are increasing, too. One supplier of such equipment recently introduced a machine capable of wrapping candy bars in heat-sealing metallized OPP at the rate of 250 a minute.

There are other savings. Koelle said he expected to realize packaging cost reductions as a result of Boyer's move from glassine to OPP. "We feel the plastic will run more efficiently on our wrapping machines," he said. "We're hoping for a saving of 5-10 per cent in materials." ■

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Outstanding	456
Above average	457
Average	458
Below average	459

GREG ERICKSON
Senior Editor

"It's amazing how fast consumer tastes change. Some big confectioners made the switch away from glassine, and suddenly the consumer began telling himself that 'quality' candy bars came in plastic wrappers."

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8/18/88

PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/AUGUST 1988

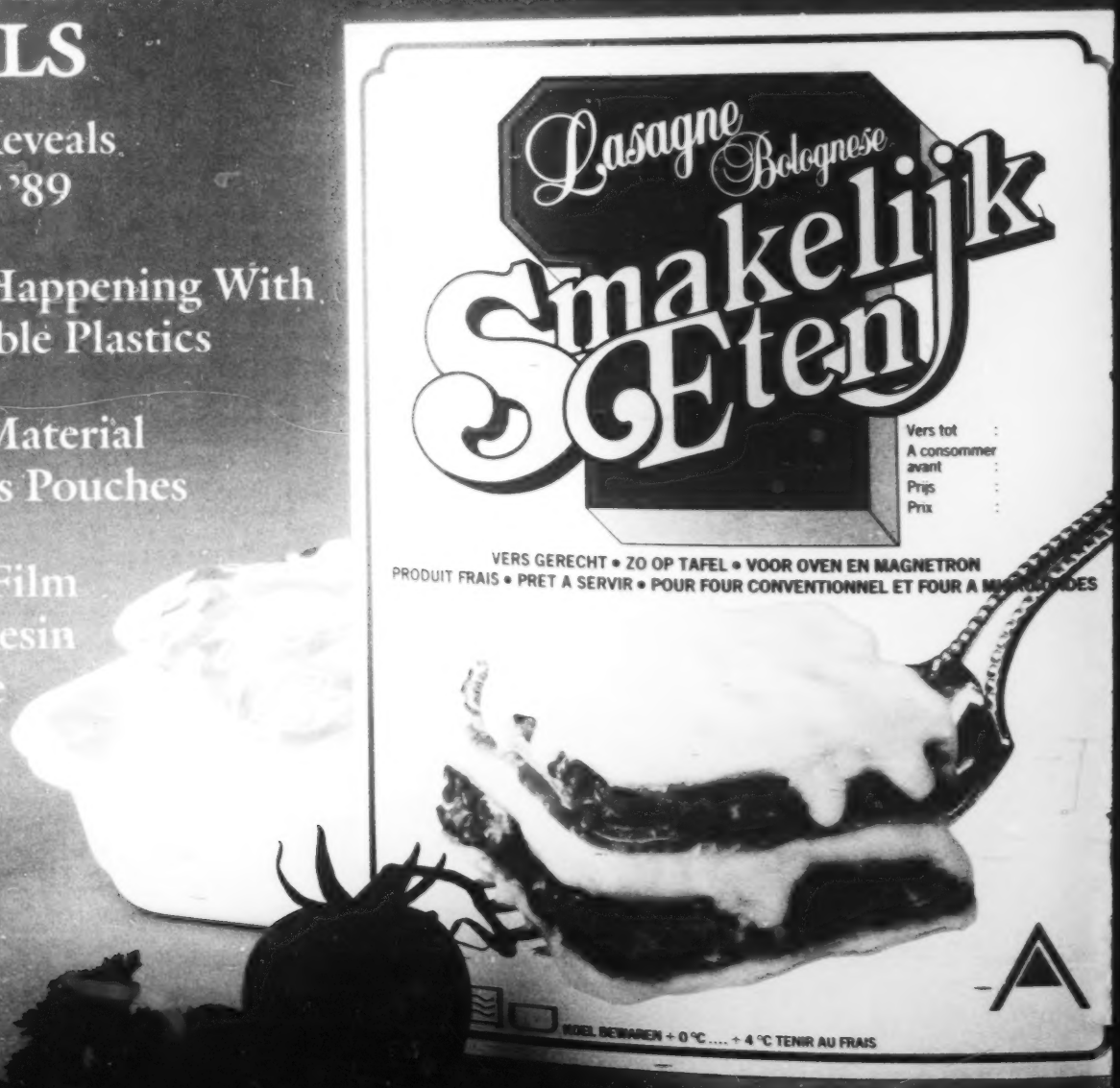
EUROPE'S NEW MICROWAVE MEALS

Survey Reveals Plans for '89

What's Happening With Degradable Plastics

Special Material Improves Pouches

Stretch-Film Fights Resin Shortage



CONTENTS

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A CAHNERS PUBLICATION VOLUME 33 NUMBER 10

PACKAGING NEWS

What's happening with degradable plastics? 8
As restrictions on packaging waste tighten up, suppliers explore polymers that break down

Microwaveable plastic bottle debuts for Kraft fudge topping 14

Antifreeze bottle has see-through level indicator 15

Preen 'n Green chooses user-friendly bottle 16

PACKAGING FEATURES

SPECIAL REPORT

Survey reveals plans for '89 38
Here's the outlook for 100 different materials, containers and concepts

PACKAGING OPERATIONS

Plant of the Month: Europe's new microwave meals 48
Novel system provides precise heat distribution with food appearance, quality intact

Pouch saves processor $500,000 93
High-barrier film proves popular for fast-food liquids

STATE OF THE ART

Stretch-film fights resin shortage 58
Pallet-film suppliers push to innovate yet pull back during resin shortage

MARKETING

Sterile bottles give O.J. 10-week shelf life 97
Five-layer construction blocks oxygen, prevents scalping to keep juice tasting fresh

PACKAGING TECHNOLOGY

Fluorinated HDPE protects flavors 100
A strictly oxygen-barrier package is no longer sufficient for many food products

Special material improves pouches 103
Low sealing temperature solves sticking problems and offers an easy-to-open package

Carnation tests applicator, cuts adhesive use by 50 per cent 112

Static-conductive lining ends fibre drum's handling problems 116

Bonding agent holds pallet loads tight during transport 118

DEPARTMENTS

EDITORIAL	3	NEW EQUIPMENT	104	ADVERTISERS INDEX	129
ASSOCIATION NEWS	28	NEW MATERIALS	113	WRAP UP	130
PEOPLE	30	CLASSIFIED	120	READER SERVICE CARD	131

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PACKAGING NEWS

Project U.S. Plastic Film Demand To Grow 3.3% Yearly Through '92

New study sees greatest opportunities for growth in LLDPE, HDPE, PP films

Based upon new technologies, moderate price increases and new market opportunities, demand for plastic film in the U.S. will grow 3.3 per cent annually through 1992 when it will total nearly 10 billion pounds, according to "–213 Plastic Films Markets," a recently released industry study from The Freedonia Group, Inc., Cleveland, Ohio.

The study concludes that the greatest opportunities are for linear low-density polyethylene, high-density polyethylene and polypropylene films in nonfood and food-packaging markets. LLDPE will grow 6 per cent annually through 1992 because of "excellent physical properties and favorable costs factors."

Other study conclusions: Key in polypropylene's growth will be the continuing replacement of traditional cellophane markets. Oriented PP has penetrated 60 per cent of the cellophane market and will continue its inroads into paper, glassine and foil. Metallized polyester, as a substitute for foil, will present opportunities for polyester films. Cellophane demand will continue to decline through 1992 because of increasing woodpulp costs and increased competition from other plastic films. It will not phase out totally because of its excellent machinability, a wide heat-seal temperature range, durability and other important characteristics.

U.S. PLASTIC FILM DEMAND
(million pounds)

Item	1977	1987	1992	2000	% Annual Growth '77-'87	% Annual Growth '87-'92
Total Film Demand	4937	8248	9700	12100	5.3	3.3
Film Demand By Resin						
Polyethylene	3830	6372	7467	9230	5.2	3.2
Polyvinyl chloride	231	435	525	670	6.5	3.8
Polyester	308	484	585	770	4.6	3.9
Polypropylene	203	494	625	845	9.3	4.8
Cellophane	158	103	90	65	–4.2	–2.7
Cellulosics	69	65	66	70	–0.6	0.3
Polyvinylidene chloride	54	93	112	135	5.6	3.8
Polystyrene	44	81	90	105	6.3	2.1
Other Resins	40	424	450	200	44.7	4.4

Source: The Freedonia Group, Inc.

The study envisions greatest market opportunities in nonfood packaging because of abundant applications, continued trends toward smaller packaging and fast product turnover. Growth will be stimulated in drug, health and beauty aids markets by needs for sterility, barrier properties and continued tamper-proof applications.

The 148-page study is available at $1,600 from The Freedonia Group, Inc. For more information circle Reader Service No. **500**.

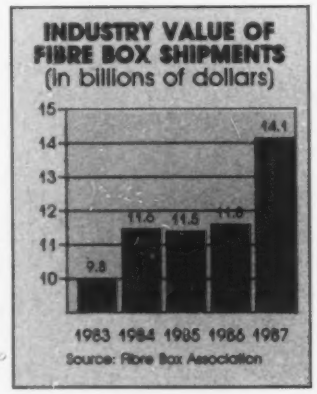
1987 Fibre Box Shipments Were Record $14.1 Billion, 19.9% Gain

Plants shipments of 297.8 billion square feet of products topping 1986 by 4.9%

The fibre box industry continued its record-breaking growth trend in 1987. According to the Fibre Box Association, value of the year's shipments was $14.1 billion, a 19.9 per cent increase over 1986, the previous high value year. Price raises in container board were a major force.

Shipments broke records in each month continuing a trend that got underway in September, 1986. October was the largest single month for 1987 shipments—almost 28 billion square feet of product. The third calendar quarter also set a quarterly record—76.4 billion square feet.

All geographic areas of the U.S. set records with the largest growth rate in the southeast, 6.1 per cent. Other areas: south central, 5.9 per cent; western, 5.1 per cent; east central, 4.3 per cent; northeastern, 3.9 per cent; north central, 3.5 per cent.



Ball Moving Plastics Division HQ

Relocation to Colorado part of consolidation of company's packaging-products businesses

Ball Corp. has begun the process of moving the headquarters of its plastic-packaging business from Evansville, Ind. to Westminster, Colo. This is part of Ball's consolidation of its packaging products business. The packaging products group is headquartered at the Ball office center in Westminster where its metal container division is also based.

"Moving our plastics division to Colorado allows us to co-locate two closely related businesses, reducing annual costs by $3 million," said Delmont A. Davis, executive vice president, packaging products.

FDA Revises T-R Packaging Requirements For O-T-C Drugs

FDA sees some current technologies incapable of meeting 1982 regulation

The Food and Drug Administration has made available a compliance policy guide that revises the list of acceptable tamper-resistant packaging technologies for over-the-counter drug products. The Flexible Packaging Association has distributed copies of the new guide to FPA members.

On Nov. 5, 1982 the FDA issued a regulation requiring that most O-T-C drug products be in T-R packaging; the packaging must use an indicator or barrier to entry that is distinctive by design or must use an identifying characteristic, such as a pattern or name. The regulation also listed 11 T-R packaging technologies capable of meeting the requirements.

Now FDA feels that some current packaging technologies cannot meet these requirements and has revised its original list. The new one focuses on O-T-C drug products but the approved packaging technologies may apply to some food products.

Quantum Chemical's USI Division To Build Centralized R&D Center

$32 million Cincinnati complex scheduled for occupancy in 1991

Quantum Chemical Corp.'s USI Division will build a $32 million research and development center adjacent to its Cincinnati headquarters. To be ready for occupancy in July, 1991, the facility will consolidate the R&D operations now housed at USI's Rolling Meadows, Ill. and Cincinnati laboratories. The new center will initially be occupied by 270 research personnel.

The center will include a two-story conference, library and administration building; a five-story building for basic, analytical and catalyst research and a three-story building for applied research. The three interconnecting buildings will have nearly 250,000 square feet of space.

More than 60,000 square feet of the applied research facility will be devoted to processing technology. All of the fabricating technology now researched at Rolling Meadows will be continued at Cincinnati.

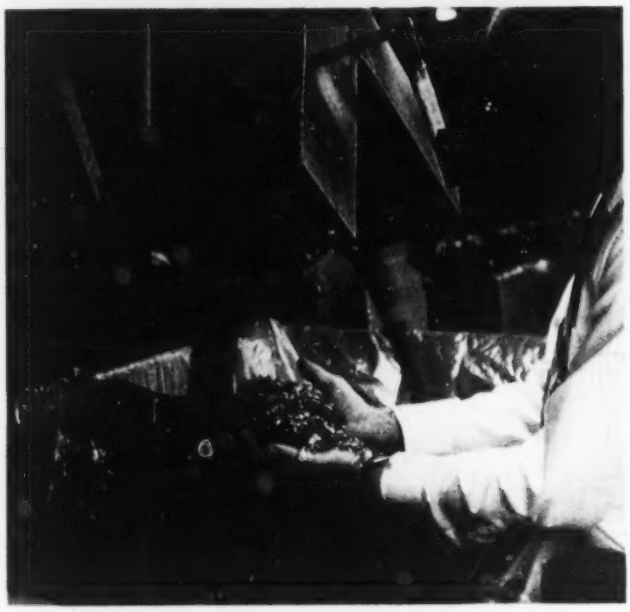
RECYCLING NEWS

Market Healthy For Used PET

Collection is the big problem, says recycler

With its 1987 sales of fiber made from waste PET (polyethylene terephthalate) beverage bottles totaling $261 million in 1987, South Carolina-based Wellman, Inc., proved that markets for this material were healthy. According to Wellman, the largest recycler of post-consumer PET bottles in the U.S., those markets are growing.

In a speech to the Recyclingplas III conference sponsored recently in Washington, D.C., by the Plastics Institute of America, Dennis Sabourin, Wellman vice president, said his company purchased 100 million pounds of bailed PET bottles in 1987—between 71 and 83 per cent of the total collected—and could have utilized twice that much. "The problem is not one of end users," said Sabourin, "The problem is the infrastructure of collection."



Flakes of clean green PET, which once composed soft-drink bottles, come spewing out into the hands of Robert Jordan, manager of Wellman's Material Recovery Division.

One effective means of both collecting and separating plastic beverage bottles is the mandatory deposit system, Sabourin said. But, he added, "The system is burdensome to the retailer and the beverage manufacturer, who has the ultimate responsibility for recycling." Curbside collection can also be effective, Sabourin said, provided a system exists for separating PET bottles from HDPE bottles. "The future of our industry," Sabourin told the audience of 300 plastics-industry representatives, "depends on our ability to solve the collection problem."

If it is solved, he said, the recycling of PET bottles could reach 50 per cent by 1992. "You can be assured that whatever mode of collection emerges, Wellman will play an active part in its development."

Fiber made by Wellman from post-consumer bottles is purchased for use in highway and railroad-bed construction, for insulation in winter coats, and for carpeting. "This year," Sabourin said, "35 per cent of the polyester carpet made in this country is made of Wellman fiber, which is made from post-consumer bottles."

Sabourin said Wellman separates clear PET bottles from green ones because fiber made from the green bottles cannot be dyed and therefore is seen as having a lower value than clear. For this reason, if bottles are shredded in mixed-color form, their recyclability is severely limited, he said.

Can Roundup Grows This Fall

Aluminum program to reach a million homes

The Great Aluminum Can Roundup, sponsored by the Can Manufacturers Institute (CMI), is being expanded this fall to reach as many as a million households in five markets.

Communities involved this year are Madison, Wisc., Columbus, Ohio, San Fernando Valley and Sacramento, Calif., and Chicago.

Right after Labor Day, volunteers will hand out free plastic bags supplied by the Hefty Bag Co., for use in saving aluminum cans. The volunteers will return later in the fall to pick up the filled bags and take them to local aluminum-can recycling centers to be redeemed for cash. The money will be returned to community groups.

Last year, the first Roundup was conducted in seven smaller markets and was a "resounding success," said Michael Dunn, CMI president.

Regions Differ On Plastic Recycling

Consumer survey reveals diverse views

Attitudes about the ease with which plastics packaging can be recycled differ regionally.

According to data collected by PACKAGING magazine for its 1988 Consumer Survey, 37.3 per cent of all respondents said they felt plastics were very easy/easy to recycle. Only 30.6 per cent of the residents of the West said they thought plastics were very easy/easy to recycle. However, more than 44 per cent of the respondents who resided in the Northeast said so.

Survey questionnaires were sent by PACKAGING to 1,000 households nationwide. Over 75 per cent of the consumers responded with opinions on a wide range of packaging-related topics. A full report on the survey results appeared in PACKAGING's June issue.

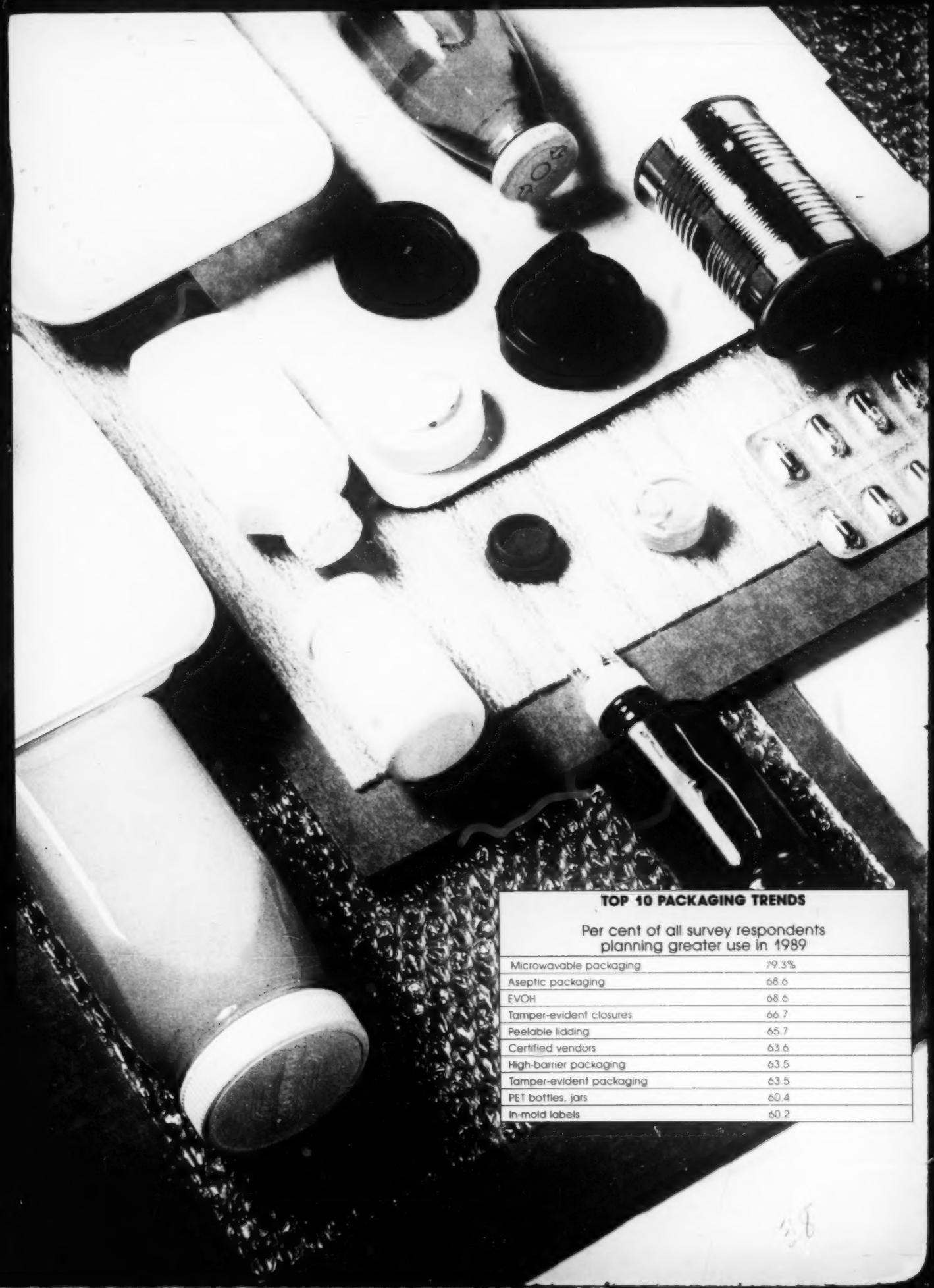
Company Wants Recycled Products

Resin plant alerts its vendors

A purchasing program implemented recently at Goodyear's polyester resin plant in Point Pleasant, W. Va., requested vendors of office products and packaging products to supply the plant with recycled materials whenever possible. "Trying to get the plant vendors to sell us products made from recycled materials shows that we are serious about recycling and the solid-waste issue," said Ed Sisson, head of the company's polyester recycling program.

Sisson noted that plastic pallet strapping, made from recycled polyester soft-drink bottles, is an example of the types of materials the plant wants to buy.

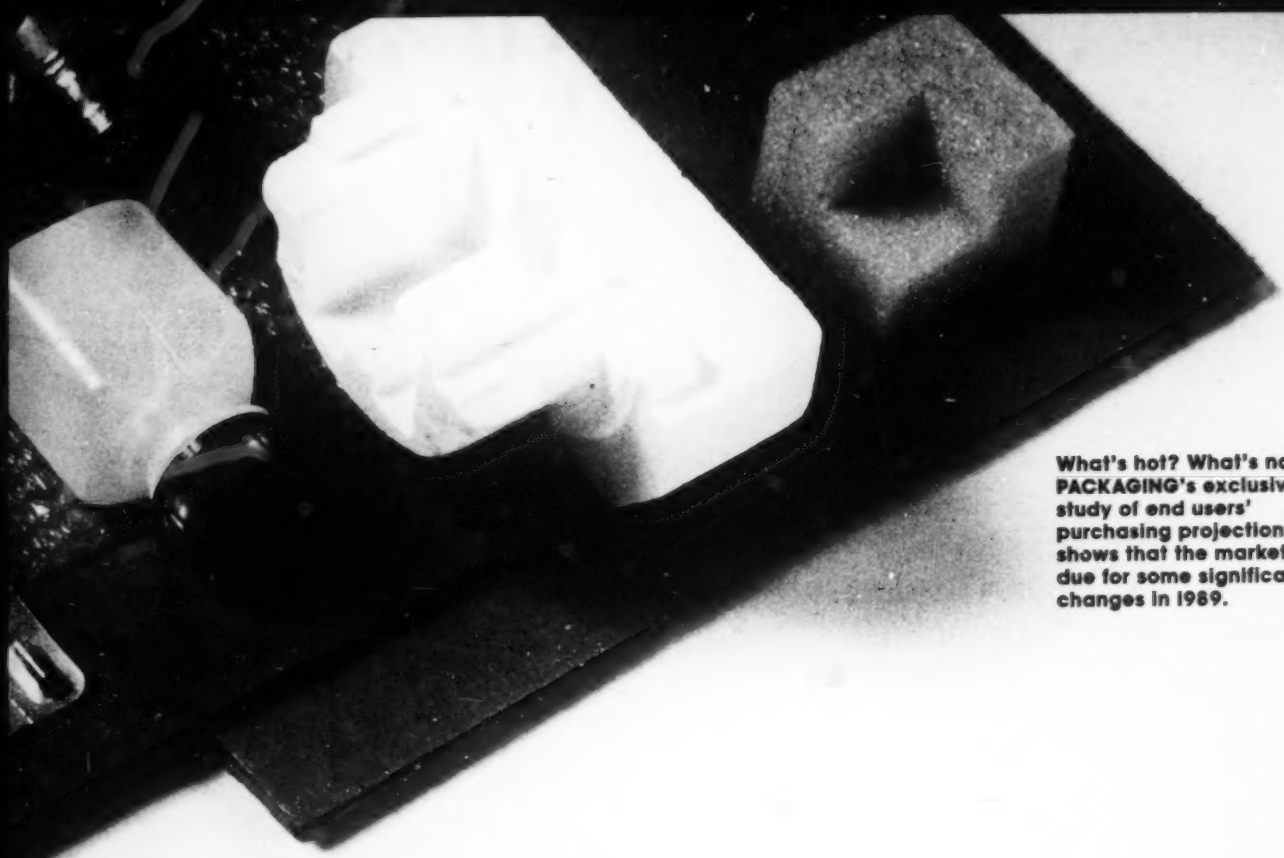
In a letter to 20 vendors, Goodyear asked them to identify any existing recycled products being sold to the plant and to "seek out and supply us with products made from recycled material."



TOP 10 PACKAGING TRENDS

Per cent of all survey respondents planning greater use in 1989

Microwavable packaging	79.3%
Aseptic packaging	68.6
EVOH	68.6
Tamper-evident closures	66.7
Peelable lidding	65.7
Certified vendors	63.6
High-barrier packaging	63.5
Tamper-evident packaging	63.5
PET bottles, jars	60.4
In-mold labels	60.2



What's hot? What's not? PACKAGING's exclusive study of end users' purchasing projections shows that the market is due for some significant changes in 1989.

SPECIAL REPORT

SURVEY REVEALS PLANS FOR '89

Here's the outlook for 100 different concepts, materials, and containers between now and 1990

By Greg Erickson
Senior Editor

Which types of packaging are most likely to grow in use during the coming year? Which ones aren't? The answers here are provided by the people who ought to know: 2,014 packaging buyers and users nationwide who responded to PACKAGING's 1988 Materials Survey.

Some clear trends

As shown in the Top 10 Packaging Trends table, the 1988 Materials Survey substantiated a number of significant packaging patterns. PACKAGING has long documented these trends by means of last year's Materials Survey and four annual Consumer Surveys. This year's Materials Survey lends additional credence to past findings by illustrating that buyers of materials for such packaging techniques plan to invest heavily in them next year.

Topping the list of high-growth concepts according to respondents in the entire survey group is microwavable packaging: 79.3 per cent of all users of microwavable packaging said they expected to use more of it in 1989 than in 1988.

It's important to break out foods processors for a closer look. As shown in the Top 20 Food-Packaging Trends table, 81.3 per cent of Foods Group users of microwavable packaging said they expected to buy more materials for it in 1989 than in 1988. That may account in part for the Top-20 rating of metallized film among respondents in the Foods Group, since this material is widely used in microwavable packaging as a susceptor. (It is also increasingly used in bags and wrappers for snack foods and confections.) The emphasis on microwavability may have helped push up projected growth figures for peelable lidding, also among the foods Top 20. It may have hurt aluminum foil trays, which are perceived by consumers as non-microwavable: Although 55.1 per cent of Foods Group users of aluminum-foil trays said they would use more of these containers in 1989 than in 1988 and 32.7 said they would use the same amount, a relatively high 12.2 per cent said they would use fewer. In comparison, Foods Group figures for plastic trays are: 56.1 per cent, more; 38.3 per cent, the same, 5.6 per cent, less.

Aseptic packaging placed second in the Top 10 Packaging Trends list for all respondents. Among all users of this technology, 68.6 per cent reported an intent to make greater use of it in 1989. The rate of use of aseptics is high among processors of canned fruits, vegetables, and preserves: 30.4 per cent. Nearly three-quarters of those users said they intended to use more aseptic packaging in 1989 than in 1988.

Tamper-evident packaging, and thus tamper-evident clo-

Over 81 per cent of Foods Group users of microwavable packaging plan to use more in '89

sures, also made the Top 10 Packaging Trends for all respondents and appears likely to grow significantly among Foods Group users next year. The Top 20 Food Packaging Trends table shows that 70.9 per cent of Foods Group users of tamper-evident packaging expect to use more of it in '89. Not unexpectedly, users of tamper-evident closures, inner seals, shrink-band closures, and shrink-band labels (which can double as neck bands), reported plans to use more of these materials next year.

High-barrier packaging as a concept and EVOH, one of the two leading high-barrier plastic resins, also scored well enough to make the list of Top 10 Packaging Trends. Plans for growth in high-barrier packaging among Foods Group users was corroborated by high growth percentages for both EVOH and PVDC.

PET leads containers

Among all respondents, PET (polyethylene terephthalate) bottles showed the largest likely increase in use of all containers for 1989 and also placed in the foods Top 20. Of all users of PET bottles —13.6 per cent of the total number of respondents—60.4 per cent said they planned to use more of them in 1989 than in 1988.

Multilayer plastic containers, plastic trays, and plastic cans also should continue their current high rate of growth among all users through 1989. Use of PVC for bottles and jars appears likely to diminish somewhat. Of all respondents now using PVC in this way, 8.5 per cent of them said they would reduce their use of it in 1989. Over 18 per cent of Foods Group users of PVC said they would use fewer of them. In contrast, less than 1 per cent of all Foods Group users of PET bottles said their use of

CONTAINERS
Current and projected use
Per cent of all survey respondents

	Currently use material	New material will begin to use in 1989	In 1989 will use: More	Same	Less
Aerosols	21.5%	0.4%	29.9%	64.9%	5.2%
Non-aerosols	15.8	0.6	42.9	56.5	0.6
Bag -in-box (dry products)	16.8	0.7	42.5	55.0	2.6
Bag-in-box (liquids)	9.2	0.7	47.3	49.3	3.4
Bags, multiwall	15.4	0.1	46.1	49.0	4.9
Bags/pouches, pre-made	29.0	1.1	44.8	49.8	5.4
Bottles/jars, glass	32.2	0.4	33.9	54.8	11.2
Bottles/jars, PET	11.7	1.9	60.4	36.7	2.8
Bottles/jars, polyethylene	31.9	0.6	54.8	42.6	2.6
Bottles/jars, PVC	13.1	0.3	43.0	48.5	8.5
Bottles/jars, polypropylene	15.3	0.2	44.1	49.8	6.0
Bottles/jars, multilayer plastics	4.7	1.0	55.0	42.2	2.8
Cans, aluminum	10.3	—	48.8	43.9	7.3
Cans, composite	5.9	0.2	33.9	54.2	11.9
Cans, paperboard	5.1	0.2	35.5	57.3	7.3
Cans, plastic	7.0	0.7	56.7	40.7	2.7
Cans, steel	20.5	0.1	39.9	49.5	10.6
Cartons, gable-top	5.8	0.3	56.6	32.6	10.9
Cartons, folding paperboard	60.9	0.5	58.0	38.8	3.2
Cups/tubs, plastic	14.5	0.7	46.6	49.0	4.4
Cups/tubs, paperboard	5.7	0.1	38.8	58.6	2.6
Dispensers, pump-type	12.8	0.6	43.8	52.1	4.1
Pails, metal	15.1	—	33.7	55.3	11.0
Pails, plastic	29.6	0.2	44.4	52.1	3.4
Trays, aluminum foil	3.3	0.1	45.1	45.1	9.9
Trays, plastic	16.4	0.8	51.9	41.8	6.2
Tubes, squeezable	11.4	0.6	49.0	44.8	6.2

PACKAGING CONCEPTS
Current and projected use
Per cent of all survey respondents

	Currently use concept	New concept will begin to use in 1989	In 1989 will use: More	Same	Less
Aseptic packaging	8.3%	1.3%	68.6%	29.3%	2.1%
Blister packaging	16.6	2.0	59.4	36.4	4.2
Certified vendors	14.8	1.2	63.6	35.7	0.6
Contract packaging	24.0	1.2	50.0	43.9	6.1
Controlled-atmosphere packaging	7.7	0.7	53.3	46.1	0.6
High-barrier packaging	9.5	1.2	63.5	35.6	1.0
Microwavable packaging	4.5	1.2	79.3	19.8	0.9
Multipacks	10.9	0.6	54.8	44.7	0.4
Plastic squeeze bottles	10.5	0.6	45.8	52.0	2.2
Rackable (display) packaging	9.4	0.7	52.7	43.3	3.9
Retortable pouches	1.3	0.3	48.6	48.6	2.9
Reclosable bags	6.3	0.7	48.6	49.3	2.2
Single-serve packaging	9.8	0.5	57.4	41.7	1.0
Skin packaging	3.0	0.2	31.7	60.3	7.9
Tamper-evident packaging	13.4	1.5	63.5	36.5	—
Unit-dose packaging	5.5	0.4	58.6	39.7	1.7
Vacuum packaging	6.5	0.4	44.1	53.7	2.2

CLOSURES Current and projected use Per cent of all survey respondents	Currently use material	New material will begin to use in 1989	In 1989 will use: More	Same	Less
Metal closures	30.5%	0.5%	35.0%	50.5%	14.5%
Plastic closures	39.0	1.0	55.3	42.6	2.1
Screw caps	31.3	0.2	45.0	51.6	3.4
Vacuum lug caps	3.2	0.2	46.1	48.7	5.3
Shrinkable bands	13.5	1.0	53.2	38.6	8.2
Inner seals	13.6	0.9	51.9	43.0	5.1
Dispensing closures (push-pull, flip top, etc.)	15.2	0.7	54.2	42.0	3.8
Dispensing closures (shaker type)	4.1	0.3	36.7	58.9	4.4
Easy-open cans	4.7	0.5	50.0	44.2	5.8
Peelable lidding	6.2	0.8	65.7	30.7	3.6
Plastic overcaps	11.5	0.4	41.1	55.5	3.4
Child-resistant	13.1	0.3	49.6	49.3	1.1
Tamper-evident closures	14.5	1.6	66.7	33.0	0.3

LABELING Current and projected use Per cent of all survey respondents	Currently use material	New material will begin to use in 1989	In 1989 will use: More	Same	Less
Foil	18.5%	1.3%	44.3%	46.1%	9.6%
Paper	68.8	0.8	49.7	45.1	5.1
Plastic	13.7	0.6	47.3	49.3	3.4
Pressure-sensitive	67.3	1.4	55.3	40.9	3.7
Adhesive applied on-line	22.3	0.9	42.7	51.9	5.3
In-mold labeling	3.4	0.8	60.2	38.6	1.1
Heat transfer	7.3	0.5	45.4	40.8	13.8
Shrinkable bands	10.1	1.8	54.4	39.4	6.2

them would drop next year.

In studying results for container use, PACKAGING broke out end users in the soft-drink subgroup of foods and beverages. The survey shows that aluminum cans are used by a higher percentage of respondents in the soft-drink industry than either PET bottles or glass bottles. The percentages were: aluminum, 60.9 per cent; PET, 58.6 per cent; glass, 48.8 per cent. Almost 16 per cent of the glass-bottle users in this subgroup said they would use fewer of them in '89; only 4 per cent of users of the other two containers said their use of them would decrease.

Gable-top cartons are used by 6.1 per cent of all survey respondents. Of those users, 56.6 per cent said they would use more of these containers in 1989. However, a fairly large percentage—10.9—said they would use fewer.

The fluid-milk subgroup provides an interesting look into possible changes in the container marketplace. Gable-tops are used by 63 per cent of respondents who package fluid milk, and 72.4 per cent of those carton users said they planned to increase their use of them next year. Polyethylene bottles are used by 30.4 per cent of the responding fluid-milk processors, and 78.6 per cent of them said they would use more of these bottles in '89 than they used in '88. Also, 30.4 per cent of the fluid-milk producers reported using aseptic packaging, and nearly 78.6 per cent of them said they would use this technology more next year.

Steel cans are used by 20.6 per cent of all Materials Survey respondents. Less than 40 per cent of the users of steel cans said they expected to increase their use of them in '89; 10.6 per cent said they would use fewer of them. Among all respondents, over 11 per cent of the users of composite cans and glass bottles and jars said they planned to lower their usage of these containers next year.

In the Pharmaceuticals Group, 61.8 per cent of the respondents are users of glass bottles, but over 19 per cent of them said their use of these containers would fall in 1989. Polyethylene bottles are used by 66.1 per cent of the Pharmaceuticals Group respondents and by 80.8 per cent of respondents in the Cosmetics Group.

For cosmetics, blister packaging seems likely to grow. Nearly 32 per cent of the respondents here are blister-pack users, and 65.6 per cent of them said their use of this form of packaging would rise in 1989. As shown on the Top 10 Pharmaceuticals-Packaging Trends table, 71.2 per cent of Pharmaceuticals Group users of blister packs said they would use more of them in 1989.

Metallization grows

Big gainers in flexible packaging materials among all respondents are likely to be metallized film, with 56.8 per cent planning to use more, and shrink film for individual packages, with 56.8 per cent expecting to increase their use of it. Slightly over 10 per cent of respondents in the Pharmaceuticals Group are users of metallized film. Over 68 per cent of them said their use of this material would increase in '89.

Flexible co-extrusions and laminations continue to expand in foods packaging. Almost 57 per cent of the Foods Group users of laminations

1988 SURVEY BIGGER, BETTER THAN 1987

PACKAGING magazine's 1988 Materials Survey is more comprehensive than the 1987 version in two important ways.

First, the range of packaging users contacted was expanded. Last year the survey focused on food and beverages. This year the survey comprises that industry, here called the Foods Group, plus the following: chemicals and allied products, which takes in the Pharmaceuticals Group and Cosmetics Group; the Electronics Group made up of electronic and other electrical equipment and components; the Instruments Group composed of makers of measuring, analyzing, and controlling instruments; stone, clay, glass, and concrete products; and miscellaneous manufacturers.

Second, this year's survey is larger in terms of the number of responses. Questionnaires went to 10,000 subscribers of PACKAGING magazine—twice as many as last year. Over 20 per cent responded.

Most of the tables show percentages for respondents who "Currently use material" as well as for "New material will begin to use in 1989." PACKAGING refers to those combined respondents as users.

Over 60 per cent of users of in-mold labeling will raise their use of it between now and 1990

and coextrusions said they planned to use more of these materials in '89. Among the flexible plastic films in foods packaging, use of polyester is growing most rapidly. Over 53 per cent of the users of this microwavable, metallizable film said they would use more of it in 1989. However, 10 per cent of them said they would use less.

Shrink-wrapped individual packages, used by 36.1 per cent of all respondents, also should see sizable growth. Of those users, 57 per cent said they would use more in 1989 than in 1988. In keeping with the high expected growth rate of stretch film for individual packages, 55.6 per cent of all the users of EVA reported plans to use more next year.

In-mold labeling rises

In-mold labeling, though currently used by only 4.2 per cent of all Materials Survey respondents, is the clear leader in terms of potential growth among all label technology in this year's survey. Over 60 per cent of all its users said they would use more in 1989 than in '88. Finding favor among high-volume users of blow-molded plastic bottles, in-mold labeling makes labeling the responsibility of the blow-molder, not the end user of the bottle.

Among respondents in the pharmaceuticals field, pressure-sensitive labels are most widely used, by 83 per cent of these respondents. And 60.9 per cent of these users said their use of pressure-sensitive labels would rise in 1989.

According to a recent report from Business Communications Co., plastic closures, especially those made of polyethylene, will eventually replace metal closures. That prediction appears sound. PACKAGING's 1988 Materials Survey shows that 40 per cent of the respondents

FLEXIBLE MATERIALS
Current and projected use
Per cent of all survey respondents

	Currently use material	New material will begin to use in 1989	In 1989 will use: More	Same	Less
Aluminum foil	12.1%	0.4%	48.4%	47.1%	4.5%
Cellophane	13.3	0.1	36.4	53.2	10.4
Co-extrusions	8.6	0.5	53.8	42.9	3.3
EVA	3.2	0.1	55.6	41.7	2.8
EVOH	1.4	0.3	68.6	28.6	2.9
Ionomer	0.9	—	11.1	72.2	16.7
Laminations	14.0	0.7	54.5	43.2	2.4
Metallized film	8.6	1.2	56.8	40.2	3.0
Nylon	3.3	0.1	34.8	62.1	3.0
Paper	20.3	0.3	44.3	52.7	3.0
Polyethylene	21.9	0.4	47.4	49.7	2.9
Polyethylene, linear low-density	11.2	0.1	52.3	45.0	2.8
Polyester	4.3	0.2	51.6	42.9	5.5
Polypropylene	12.5	0.2	45.0	51.8	3.2
PVC	9.2	0.1	45.7	47.9	6.4
PVDC	2.0	0.1	53.2	44.7	2.1
Shrink film (individual packages)	34.3	1.8	57.0	39.2	3.8
Stretch film (individual packages)	26.8	0.5	54.9	43.1	2.0

CASE PACKING/SHIPPING
Current and projected use
Per cent of all survey respondents

	Currently use material	New material will begin to use in 1989	In 1989 will use: More	Same	Less
Bulk boxes, corrugated	63.3%	0.7%	53.6%	43.9%	2.5%
Bulk boxes, metal	1.4	0.1	31.4	60.0	8.6
Bulk boxes, plastic	4.1	—	36.6	57.3	6.1
Corrugated cases	56.8	0.3	58.1	40.2	1.7
Corrugated cases, high-strength	16.1	0.7	51.6	45.7	2.7
Corrugated cases, partitioned	26.0	0.5	44.4	50.8	4.9
Corrugated cases, preprinted linerboard	18.4	0.7	55.2	41.1	3.7
Cushioning, plastic foam	16.4	0.2	44.3	52.0	3.7
Cushioning, paper, corrugated	9.3	—	36.5	59.4	4.2
Cushioning, foam-in-place	5.3	0.3	36.4	52.7	10.9
Cushioning, preformed plastic	5.0	0.2	40.8	53.4	5.8
Cushioning, anti-static	3.8	0.4	53.2	43.0	3.8
Cushioning, fire-retardant	0.7	—	58.8	29.4	11.8
Drums, corrugated	13.1	0.3	33.0	59.9	7.1
Drums, plastic	17.0	0.1	44.3	51.0	4.7
Drums, metal	24.3	0.1	34.2	56.1	9.6
Pallets, plastic	7.1	0.6	48.4	50.9	0.6
Pallets, wood	66.2	0.4	45.8	49.7	4.5
Shrink-film, tray-packs	13.5	0.7	49.3	48.2	2.5
Slip sheets	20.9	0.3	40.7	53.6	5.6
Stretch wrap, unit loads	48.7	0.7	55.8	43.7	0.5
Strapping, metal	16.5	0.1	27.5	59.6	12.8
Strapping, plastic	33.1	0.3	39.5	54.3	6.2
Tape, gummed	50.3	0.2	41.1	53.4	5.5
Tape, pressure-sensitive	47.1	0.6	48.3	48.5	3.2

TOP 20 FOOD PACKAGING TRENDS Per cent of food and beverage respondents planning greater use in 1989	
Microwavable packaging	81.3%
Tamper-evident closures	76.6
Aspetic packaging	71.3
Tamper-evident packaging	70.9
Shrink-band closures	69.9
EVOH	68.2
PET bottles, jars	67.8
High-barrier packaging	67.1
Shrink-band labels	64.7
PVDC	63.2
In-mold labels	62.5
Peelable lidding	61.7
Inner seals	61.6
EVA	61.3
Plastic cans	61.0
Single-serve packaging	60.6
Dispensing closures	60.0
Plastic squeeze bottles	60.0
Metallized film	60.0
Corrugated cases	59.7

TOP 10 PHARMACEUTICAL-PACKAGING TRENDS Per cent of pharmaceuticals respondents planning greater use in 1989	
LLDPE	78.6%
Blister packaging	71.2
Metallized film	68.4
Certified vendors	66.0
Shrinkable-band labels	65.1
Multipacks	64.0
Rackable packaging	62.1
Pump dispensers	61.5
Shrink film for individual packages	61.4
Corrugated cases	61.2

TOP 10 COSMETICS-PACKAGING TRENDS Per cent of perfume and cosmetics respondents planning greater use in 1989	
Tamper-evident packaging	90.9%
Certified vendors	82.1
PET bottles, jars	80.0
Stretch film for individual packages	78.1
LLDPE	76.9
Aluminum foil	75.0
Shrink film for individual packages	68.3
Preprinted linerboard for corrugated cases	66.7
Non-aerosols	65.3
Polyethylene bottles, jars	65.0

use plastic closures and 31 per cent use metal. Of the plastic-closure users, 55.3 per cent said they expected to use more of them in 1989 than in '88 and only 2.1 per cent said they would use fewer. But only 35 per cent of the metal-closure users said they would use more of them in 1989 and 14.5 per cent said they would use fewer.

Furthermore, between 13 and 16 per cent of the processors of canned fruits, vegetables, preserves, and salad dressings who use metal closures said they intended to use fewer of them in '89, but none of the users of plastic closures in this subgroup said their use of them would drop. Metal closures are used by 68.3 per cent of the respondents in the soft-drink field; plastic, by 51.2 per cent. That ratio is likely to change, too: 19.2 per cent of the metal-closure users in this category said their use of them would decrease next year, but only 4.2 per cent of the plastic-closure users said their use of them would drop.

Corrugated stays strong

Of all users of corrugated cases, 58.1 per cent said they expected to increase their use of them next year and only an insignificant 1.7 per cent said they would use fewer. High-strength corrugated, in use by a much smaller percentage of respondents than regular corrugated, is not likely to expand as much as the standard material. But preprinted linerboard for corrugated cases should gain significantly. More than 19 per cent of all the survey respondents are users of preprint, and well more than half of them said they planned to increase their use of it in '89.

Corrugated is facing some tough competition, though. Film-wrapped tray packs, which reduce the amount of corrugated needed to securely contain a case's worth of bottles, for example, are enjoying high popularity. Among Foods Group users of shrink-film tray packs, 57.1 per cent said they would use more of them in '89.

Stretch wrap for unit loads also appears likely to continue growing. It is now used by more than half the Materials Survey respondents. Of those users, 55.8 per cent said they expected their use of stretch film to increase. Less than 1 per cent said they thought it would drop.

Cushioning that does more than just cushion is likely to become more prevalent within the subgroup using it most extensively now. Anti-static cushioning is currently used by only 4.2 per cent of all survey respondents, but by almost 23 per cent of respondents in the Electronics Group. Fully 60 per cent of the Instruments Group users of this material said they expected to use more in 1989.

Foam-in-place cushioning is presently used by 14 per cent of the respondents in the Electronics Group. Only 12.5 per cent of these respondents said they planned to use more in 1989. ■

Additional information about packaging materials, containers and components, and industrial and shipping supplies is published in PACKAGING's Encyclopedia, pages 29 to 139.

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GREG ERICKSON
Senior Editor

"Attitudes change. New laws take effect. Innovative products and materials come to market. For anyone who sells or buys packaging, that's a lot to keep track of. Fortunately, more than 2,000 PACKAGING subscribers provided a wealth of information about their plans. It's of vital interest to the entire industry."

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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/SEPTEMBER 1988

PACKAGING's 1988 Innovator Awards

New Ideas For Handling Cases

Innovative Inks Improve Coding

Form-Fill-Seal Expects New Era

Automatic Cushioning Reduces Labor 90%

"Fail-Safe" Packaging Keeps Product Sterile

CONTENTS

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A CAHNERS PUBLICATION VOLUME 33 NUMBER 11

PACKAGING NEWS

Peelable lid enters era of zero-defects 8
Statistical Process Control ensures top quality for debut of multilayer membrane

Tabbed-overcap dispenser introduced for Nice 'n Easy bottle 14

Fibreglass shipper holds complete lasography system 15

Redesigned carriers for Augsburger beer match product's super-premium status 16

PACKAGING FEATURES

SPECIAL REPORTS

PACKAGING's 1988 Innovator Awards 34
The year's most significant developments in machinery, materials and retail packages

What's happening at the line's end? 76
From case packing to pallet loading, new technologies push packagers toward system-thinking

PACKAGING OPERATIONS

Plant of the Month: Fail-safe system keeps product sterile 54
Smooth flow for short runs depends on enough space to store work going through

Foam-in-place reduces labor 90% 70
Automated system cuts publisher's loose-pick labor and protects books better, too

MARKETING

Silver indicates 'lite' 63
Silver is becoming the color of choice to package new "lite" products

STATE OF THE ART

Form-fill-seal: New demands coming 64
The emerging flexible automation will redefine tomorrow's pouch machinery

PACKAGING TECHNOLOGY

Research yields advanced coding inks 86
They help to raise line speeds, preserve package graphics . . . even tell the temperature

Form-fill-sealer turns out 180 a minute with a single filling tube 104

DEPARTMENTS

EDITORIAL	3	NEW EQUIPMENT	94	ADVERTISERS INDEX	130
ASSOCIATION NEWS	24	NEW MATERIALS	111	WRAP UP	130
PEOPLE	26	CLASSIFIED	122	READER SERVICE CARD	131

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RECYCLING NEWS

Store Machine Gobbles Up PET

Bottle crusher reads UPC codes

You would expect a man who sells reverse-vending machines to advocate beverage-container deposit laws, and Mike Cosgrove, general manager of Kansmacker, Inc., does.

Michigan, where Cosgrove's company is headquartered, has a "bottle bill" and charges a hefty deposit for aluminum, glass, and plastic beverage containers. Cosgrove told PACKAGING, "You find very few bottles along the highways and byways here." The deposit law has done more than reduce litter, he said. "It has raised individuals' awareness . . . there is a second thought taking place before they throw other things out."

Kansmacker, maker of reverse-vending machines for aluminum cans, is now test-marketing similar machines that accommodate PET (polyethylene terephthalate) bottles. A laser inside the machine reads bar codes on bottle labels to determine whether the bottle should be accepted or rejected. If accepted, it is pierced, crushed, and stored in a bin. Buyers of post-consumer PET have said they prefer crushed bottles because they are more cost-efficient to ship than noncrushed bottles.

The Kansmacker plastic-bottle machine can accommodate bottles in sizes from a half-liter to three liters. Cosgrove said it could eventually also handle 12-ounce PET beverage cans.

Cosgrove said he expects the plastic-bottle machine to be popular with grocers in Michigan and other deposit-law states. He added that it could find use in no-deposit states also as a means of fending off laws that would tax or ban various kinds of beverage containers.

"With our aluminum-can machine," he said, "we've had pronounced interest this year among merchants in nondeposit-law states." These grocers, he said, "go back to their legislative bodies and say they are doing something."

PET-gobbling reverse-vending machines like this one could begin appearing soon in supermarkets located in "bottle-bill" states. The machine reads UPC information, which tells it whether to accept or reject each bottle.

Consumers Ready To Change Habits

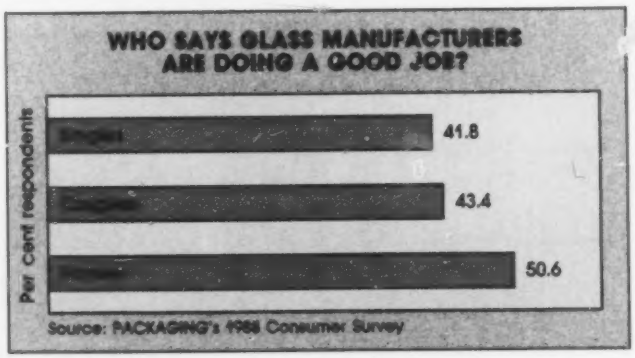
Poll shows they would favor recyclables

According to new research by The Gallup Organization, 54 per cent of all Americans would change their purchasing habits to buy foods and beverages sold in containers that recycle. Just 33.3 per cent of the poll respondents said they would not make the switch.

The survey was commissioned last spring by the Glass Packaging Institute, headquartered in Washington, D.C.

Fully 60 per cent of consumers with incomes over $40,000 said they would switch to a product in a recyclable container if they knew that their current brand choice was not sold in packaging that recycles.

"The Gallup poll results confirm a belief we've held for some time," said Lewis D. Andrews, president of the Glass Packaging Institute, "recyclable packaging sells."



Glass Companies Get High Marks

Consumers say they do good recycling job

Over 46 per cent of all respondents to PACKAGING's 1988 Consumer Survey said they believed glass manufacturers were doing a good job of recycling used glass containers. Less than 25 per cent said the glass makers were doing a fair job, and only 17.1 per cent said they were doing a poor/very poor job.

Significant differences in opinion were reported by respondents in various lifestages, which included singles, couples, and parents—each in three age groups. The highest percentage of respondents in any lifestage rating glass makers's recycling efforts good were parents, with 50.6. Only 41.8 per cent of the singles gave the glass companies that rating.

Of the 1,000 households contacted, 756 consumers responded to the survey with opinions on a wide variety of packaging topics. A full report on the results appeared in PACKAGING's June 1988 issue.

Group Studies Plastic Fuel

Resin company funds incineration project

Scheduled to conclude within a few weeks is a study on the use of plastic waste as fuel for small power plants. Funded by Mobil Chemical Co., the Babcok & Wilcox study is expected to determine whether plastic waste could feasibly be used to facilitate mass-burn incineration.

Robert J. Barrett, general manager of Mobil's Solid Waste Management Solutions group, said plastics have four times the fuel value of the average mix of municipal solid waste—about the same as that of fuel oil. Separating and perhaps pelletizing such waste, Barrett said, would serve a dual purpose. "Using plastics from the waste stream as a fuel source would not only be an important form of recycling; it would also conserve fossil fuels."

In addition, it could raise the incineration temperature, helping to burn all the waste cleanly.

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PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/OCTOBER 1988

HIGH-TECH FILMS BOOST OPTIONS

Planning Guide For Pack Expo '88 Features Pocket Guide

Gearing A Line For Varied Products

Microwave Cooks Up Package Safety Issues

Cartoner Hikes Drug Line Productivity

CONTENTS

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PACKAGING NEWS

Recycler buys billions of used PET bottles 8
Wellman, Inc., turns used plastic soft-drink containers into useful polyester fibre

Packaging system scores for sporting goods firm 14

Winning students honored for package designs 15

PACKAGING FEATURES

STATE OF THE ART

High-tech films come on strong 40
Despite pricing worries, flexible plastics leaders keep introducing high-performance materials

PACKAGING OPERATIONS

Plant of the Month: Gear lines to output diversity 50
Build machine versatility, shift equipment from line to line, fit manual tasks to lines' needs

Cushioning system saves $1 per case 68
Adhesive-coated loose fill provides competitive edge for mail-order firm

SPECIAL REPORTS

Microwave packaging cooks up conflicts 60
Package-safety concerns have emerged as a side effect of the microwave boom

Pack Expo '88 Planning Guide 70
Almost 40,000 packaging professionals will roam the "miles of aisles" at McCormick Place

How packagers meet tough challenges 7
IPW's own "think tank" delves into the latest topics affecting the industry

New developments highlight Pack Expo '88 10
Exclusive report on the newest innovations in machinery, materials and containers

MARKETING

New packages revitalize beverages 62
Drink-makers innovate to satisfy consumers' never-ending thirst for something new

PACKAGING TECHNOLOGY

New line hikes productivity 250% 15
Speed of carton changeover makes Merck-Frosst's operation highly flexible

Dairy gets clean marks with reciprocating coders 18

J-I-T labeling system ends "record-keeping nightmare" 18

Test-market sales triple with successful product-package combination 18

DEPARTMENTS

EDITORIAL	3	PEOPLE	30	CLASSIFIED	19
PACKAGING NEWS	21	RECYCLING NEWS	32	ADVERTISERS INDEX	20
CALENDAR	22	NEW EQUIPMENT	158	WRAP UP	20
ASSOCIATION NEWS	26	NEW MATERIALS	185	READER SERVICE CARD	20

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PACKAGING NEWS

New York Seltzer Stops Test, Petainer Machines Sold

Constar, PLM sell equipment to Japanese firm, retain U.S. rights

The tale of the Petainer soft-drink can has taken another twist, as both the Japanese manufacturing rights and the only machinery capable of making the PET can are sold to an unnamed Japanese packaging firm. Meanwhile, Original New York Seltzer U.S.A. (ONYS) of Walnut, Calif.—currently the only U.S. user—has announced that it is suspending the can's test market.

Constar International, which owns Petainer Development Company with partner PLM AB issued a press release admitting that Petainer had sustained "relatively large losses" and that it was writing off the sale of the assets of Petainer, believed to consist almost solely of the machinery. However, Constar and PLM have retained their U.S. rights to the Petainer technology. "If the can is successful in Japan, and if certain manufacturing problems are solved, it's possible that another U.S. test could take place," said Constar spokesman James J. Goldman.

In 1985, Coca-Cola USA test-marketed the Petainer in the Columbus, Ga. area. Coke suspended the test in early 1986, saying that it wanted to "focus on developing and improving viable recycling systems."

The official statement by ONYS stated in part, "Consumer reaction to this fully recyclable package has been extremely positive. Unfortunately, the relatively high cost of this PET package has led us to conclude that it will be extremely difficult to price the plastic can competitively with either glass or aluminum at the retail level." The firm said it will deplete existing inventories of the plastic can before terminating its use.

New York Seltzer has terminated its test market of the Petainer PET can.

MEDICAL PACKAGING MARKETS

Market Segment	$ Million 1987	[illegible]	[illegible]	Average Annual Growth 1987-92
Pharmaceuticals	4750	[illegible]	[illegible]	[illegible]
Medical devices & hospital supplies	2100	[illegible]	[illegible]	[illegible]
Medical diagnostic kits	100	[illegible]	[illegible]	[illegible]
TOTAL	6950	8280	9810	3.6
Materials*				
Plastics**	2255	[illegible]	[illegible]	[illegible]
Paper and paperboard	2303	2579	[illegible]	[illegible]
Glass	974	904	[illegible]	−1.5
Metals	155	196	[illegible]	[illegible]
Other	118	179	[illegible]	[illegible]
TOTAL	5805	7050	8040	4.0

Values in Table are in 1987 dollars.

Source: Various published data and Business Communications Co., Inc. estimates.
◊Average annual growth rate.
*The values are for unprocessed raw materials used.
**The principal plastics used in medical packaging are PVC, styrenics, polyethylenes, polypropylene and polyesters.

Medical Device Packaging Will Reach $2.6 Billion By 1992

Study says aggregate growth rate will be 4% per year for next five years

A bright future for certain segments of the medical packaging market are predicted in a recently released study by Business Communications Co., Inc., Norwalk, Conn.

A growing, aging population with increased need for medical devices and pharmaceuticals, increased plastics packaging, attempts to limit healthcare costs and the trend toward unit-doses and generics are seen as factors driving packaging change in the medical markets.

According to the study, the value of packaging for medical devices and hospital supplies will rise from just over $2 billion in 1987 to $2.6 billion by 1992. Surgical supplies and instruments subsegment of total will grow even faster. Medical diagnostic kits are also slated for healthy growth.

The study, entitled P-107 Medical Packaging, is available at $2,250 from Business Communications Co., Inc. For more information, circle Reader Service No. **422**.

U.S. Aluminum Shipments Up 4.1% in 1987

Containers and packaging account for 27.8% of total

Shipments of aluminum to U.S. markets in 1987 reached 15.0 billion pounds, up 4.1 per cent from 1986 shipments of 14.4 billion pounds, according to data released by the Aluminum Association. Total aluminum shipments, including exports, reached 16.3 billion pounds, up 6.1 per cent from the previous year.

Shipments to the containers and packaging market were 4.5 billion pounds, continuing to make this the largest single category, with 27.8 per cent.

These data, along with additional aluminum industry statistics, have been published in the *Aluminum Statistical Review for 1987*, the association's annual publication. It includes data on shipments, markets, supply, U.S. foreign trade statistics, and world statistics. Copies are available from the association at a cost of $50 per copy, plus $7 for postage and handling. For more information and an order form, circle Service No. **420**.

U.S. Ethylene Overcapacity Potential Seen By 1991

Expansion plans could shift supply/demand balance, says survey

Current expansion plans have the potential to reverse the tight supply/demand balance in the U.S. ethylene market. Supply additions could lead to a return to industry overcapacity by the early 1990s, according to a report issued by Bonner & Moore Market Consultants, Houston, Tex. Ethylene has been in tight supply for the past year, and prices have doubled.

The report is based on a survey of all U.S. ethylene producers as well as an analysis of ethylene supply/demand across the next five years.

"U.S. ethylene producers plan to add about 10.5 billion pounds of capacity by 1993," said Bill Urquhart, manager of chemical planning for the firm. "That would be a jump of about 29 per cent above midyear 1988 capacity levels. Such an increase could result in temporary overcapacity and lower ethylene prices as soon as 1991-1992." For further information, circle Reader Service No. **421**.

RECYCLING NEWS

Plastic Bottle Gets 100 Refills

Some are still in use after 15 years

Is the returnable, refillable milk bottle an idea whose time has come . . . again? General Electric would like to think so.

Currently in use by more than 20 dairies in the U.S. is a returnable, refillable bottle made not of glass but GE's Lexan polycarbonate resin. Some of those dairies have been using the Lexan bottle since the early '70s, but without much fanfare. Will the resurgence of interest in environmental issues stimulate greater acceptance of this container?

According to Bill Dake, president of Stewart's Ice Cream Co., Saratoga Springs, N.Y., the Lexan bottle could account for two-thirds of all milk packaged in the United States by the late '90s. At present, Stewart's is packaging half its 120,000 gallon/week output in the polycarbonate bottle, which has been well-received by consumers who buy their milk from Stewart's 163 dairy-owned convenience stores.

Returnable polycarbonate bottles used by a dairy get a visual inspection. Some of the plastic bottles have been in continuous use since the 1970s.

Dake said he regularly gets 50 to 100 fillings from a single bottle. GE advertises a lifespan of eight to 10 years. Said Dave Handler, market development specialist for GE's GPAX Programs, "The bottles are dated on the bottom when they are molded. I've visited dairies that are using them and found bottles from the 1970s still in use." During that time, some scuffing does occur, Handler said. That can be minimized by molding in textured "bumpers" when the bottle is blown.

Handler said GE has a buy-back program in place. "We buy the used bottles back in whole or ground form. We can recompound that material for automotive or other engineering uses. There's a very good market for that."

One potential problem with plastic refillable containers is the chance that consumers will use them to store such things as turpentine. Sniffing machines can be used to find bottles contaminated in this way. In addition, said Handler, "The poor chemical resistance of polycarbonate acts as a benefit here. If anyone has put gasoline or turpentine in the bottle, it will crack." All bottles coming back to the dairies are visually inspected, just as glass bottles always used to be.

Will polycarbonate eventually find its way into the soft-drink and beer industry? Possibly, but not in its present monolayer form. An inner layer of barrier material would be needed to contain the carbon dioxide.

PET Recycler Likes Curbside

Expansion depends on mandatory collection

Only one recycler of post-consumer PET (polyethylene terephthalate) bottles is presently obtaining its feedstock from voluntary collection programs. St. Jude Polymer, Frackville, Pa., recycles bottles collected by residents of small communities in Pennsylvania and Rhode Island.

Steve Babinchak, president, said his company's capacity is now 25 million pounds per year. St. Jude is adding new recycling capacity every four months and expects to reach 150 million pounds by 1995—if sufficient quantities of PET become available.

To get that much of the material, Babinchak said, he is counting not on deposit laws but on curbside collection. He termed the latter system "the way of the future."

Aluminum Leads In Acceptance

Consumers report on local recycling centers

Aluminum is the packaging material most widely accepted by recycling centers across the country, according to a recent survey of 1,000 U.S. households by PACKAGING magazine. A total of 756 consumers responded to the survey with their opinions on a wide range of packaging-related topics.

Among respondents who said a recycling collection center was located near their home, 90.2 per cent reported that that center accepted aluminum. More than 42 per cent of the respondents said their local recycling collection center accepted glass. Only 12.7 per cent said their center took in steel; 9.5 per cent said it accepted plastics.

A complete report on PACKAGING's fourth annual Consumer Survey appeared in June.

Additives Make Plastics Degrade

Sunlight isn't needed to trigger breakdown

Two biodegradable concentrates introduced recently by Ampacet Corp. cause degradation of polyethylene.

The two new additives, Poly Grade II and Poly-Grade III, joi other concentrates made b Ampacet for use in phot degradable mulch bags and tras bags. Poly-Grade II is starch based. Poly-Grade III combine starch with additives that d grade in sunlight.

The latter additive, by makin plastics biodegradable as well photodegradable, reduces th amount of sunlight needed trigger degradation. A Ampacet spokesperson said th is important because some c mates do not have periods sunlight long enough or inten enough to break down phot degradable-only plastics.

New Packages

Brewers continue to innovate. The glass long-neck is back (in non-returnable form) and is available in a twenty-six bottle!

Revitalize 'Old' Products

Drink makers innovate to satisfy the consumer's never-ending thirst for something new

By Greg Erickson
Senior Editor

Each year, it is estimated, the average American consumes more than 45 gallons of soft drinks. Add beer, juices and juice drinks, bottled water, drink mixes, wine, and spirits, and the figure rises to more than 95 gallons. You have to wonder why we don't make gurgling noises when we walk.

Driven by the consumer's thirst for anything new and different, the beverage industry today continues to introduce new flavors, brands, and whole drink categories. Though bottlers are striving to standardize their containers, surprising shapes and sizes have been making their debut.

There appears to be no limit to how much the consumer will drink these days at one sitting. Two soft-drink giants are testing 20-ounce glass bottles—a size which some industry insiders see as a possible replacement for the 16-ounce glass bottle. An aluminum company has attracted attention with its 24-ounce and 32-ounce cans. They are likely to appear on store shelves soon with resealable plastic closures.

Aluminum cans of all sizes stand to benefit from increased consumer awareness of the recycling issue. Respondents to PACKAGING's 1988 Consumer Survey said they felt aluminum companies had the best recycling reputation. Glass came in second. Steel placed a distant third. Plastics came in last.

However, the steel industry recently announced plans to work toward improving its recycling record by setting up a container buy-back program. And companies like Wellman, Inc., are making money turning post-consumer PET (polyethylene terephthalate) into carpeting and fiberfill. Reverse-vending machines that accept PET containers are being marketed in bottle-bill states. And one supplier of PET bottles to the beverage industry has proudly developed a 2-liter bottle with a clear base cup made almost entirely of recycled post-consumer PET.

The market for 2-liter PET bottles is growing at a rate of 8 per cent a year; for 1-liter bottles, at 10 to 12 per cent;

A disposable plastic "keg" and reusable pump are now being marketed by a major beer company.

Who's using the recycling issue to their advantage? Everyone: glass, aluminum, PET, paper . . . even steel

and for 16-ounce PET, at 15 to 16 per cent.

Who is using the recycling issue to their advantage? Everyone, it seems. Billboards proclaim that PET is recyclable; soft-drink bottlers who use glass put pro-recycling messages on their labels; aluminum suppliers celebrate their can-collection successes. Steel makers tout the advantages of magnetic separation of used containers from the waste stream. And even a supplier of paperboard multipacks is getting into the act by using the term "biodegradable" in its product promotions.

A move to standard sizes

Historically, the soft-drink industry has grown by means of its ability to give the consumer several choices of containers. "But now," said an executive with a supplier of paperboard for the beverage industry, "the bottlers want to get some consistency in their packages." With filling rates of 2,000 containers/minute and higher the goal, it's no wonder that, as he put it, "new packages are becoming very difficult to work into the system."

He said he believed that soft-drink bottlers might eventually converge on just two industry-standard packages: the 2-liter PET bottle and the 12-ounce aluminum can. If there is to be a third, he said, it will likely be single-serve glass. Naturally, representatives of the glass and steel industries begged to differ.

The glass makers cited great progress being made in lightweighting glass bottles —making them lighter than before but just as strong— through a process called press-and-blow. One glass-industry spokesperson told PACKAGING that this could result in a weight reduction of 2 ounces for the typical single-serve beer bottle.

This sounds promising. But brewers will have to go slowly. Such lightweighting, if done all at once, could give consumers the feeling that something was "just not right" with their favorite brew. Also, lightweighting of beer bottles must be accompanied by an increase in the amount of brown or green colorant so as to keep them looking appropriately dark.

The glass industry also feels good about the long-neck bottle, which has been reincarnated in nonrefillable form. Several brewers and at least one bottler of root beer are charging ahead with the long-neck in either amber or green. One brewer recently introduced a green long-neck with an applied-color, or painted, label that conveys a distinctly old-world feeling. And soon to be introduced by a beer giant for its flagship brand is a 7-ounce long-neck. Presently, that company's 7-ounce bottle is a downsized version of its squatty 12-ounce.

Steel cans may make a new dent in the aluminum-can market, although few of PACKAGING's sources outside the steel industry expected it to be big. Rising prices are making aluminum less competitive relative to steel than it has been, just as rising PET-resin prices have lowered that material's competitiveness somewhat in relation to glass. But steel has slipped in beverage-container market share from 100 per cent in 1958 to 45 per cent in 1978 and to only 5 per cent in 1988. Said the spokesperson for a leading PET supplier, "I think Coca-Cola will give steel every opportunity to

CONSUMER BEVERAGE-PACKAGING PREFERENCES

Source: PACKAGING'S 1983 Consumer Survey

compete in order to hold down prices. But aluminum is a big, well-oiled machine and is very well-entrenched."

Talk to a representative of a steel-sheet supplier, though, and you leave with the feeling that steel may be poised to give aluminum a run for its money. The spokesman touted his material's biodegradability—a concept that is strange but true. He boasted of the lightweighting that has already been done and the fact that steel beverage cans are inherently stronger than aluminum cans of comparable thickness. He concluded his comments with this prediction: "There will be 50 per cent more steel beverage can lines on stream at the end of 1988 than there were in the fourth quarter of 1987."

Plastic has not yet found domestic use as a packaging material for single-serve beer. One big brewer, however, has introduced a plastic "Party Ball" complete with a spigot and an ice-containing wraparound carton. This spherical container, like those previously used by other brewers and a wine company, is in essence a disposable keg.

Bigger multipacks

Multipacks of diverse sizes let bottlers alter product quantities without changing their primary packages. Though the 12-can pack still has not reached maturity, 15s are being introduced, as are 16s, 18s, 20s, and 24s. Multipacks containing 30 and even 36 cans may not be far away. These big multipacks present a bigger "billboard" in the store—important because as much as two-thirds of all soft-drink sales are impulse buys.

Bottlers who use glass have not done anywhere near this much experimenting with multipacks. But one industry executive said he expected to see an increasing number of 12 packs of glass bottles. One such package is already available for beer.

Among bottlers contacted for PACKAGING's 1988 Materials Survey, only 38.5 per cent of the current users of metal closures said they expected to use more of them in 1989; 62.5 per cent of the users of plastic closures said they planned to use more.

A representative of a manufacturer of both types said that the plastic closure now accounts for 30 per cent of the total soft-drink container market—an eight-point jump since a year ago. Some industry-sponsored consumer surveys have shown a 14-to-1 preference for plastic over aluminum.

A shortage of closures made of both materials is now a concern throughout the soft-drink industry. One supplier blames the bottlers. "When bottlers are ready to make a packaging change," he said, "the first thing they do is go to the glass people, to PET, to cans, labels, and cartons and say, 'We're ready to make a change. Can you support it?' They don't come to the closure people because there has always been an overcapacity." Now that has changed. Manufacturer consolidation, indecision regarding the switch from aluminum to plastic and from heat-shrink plastic to mechanical plastic, plus high growth in single-serve container sizes have contributed to the closure crunch.

Aseptics for adults

Despite double-digit sales growth for each of the past two years, the aseptic "brick" beverage package continues to be perceived by consumers as something meant for kids. In fact, the demographics are shifting toward older consumers. According to one major supplier of this type of container, here is how sales break down by age groups:

In 1985, consumer users of the aseptic package under six years old represented 20 per cent of the total; 6-12 years, 42 per cent; 13-17 years, 9 per cent; 18 or older, 29 per cent. In 1986 the numbers were 6 and under, 16 per cent; 6-12 years, 32 per cent; 13-17 years, 12 per cent, and 18 or older, 40 per cent. Recent FDA approval of aspartame in aseptics is seen as an excellent opportunity for makers of this package to grab a greater share of the adult diet-drink market. Aseptics in adult-portion 12-ounce sizes are being introduced regularly.

Another new development in the aseptic field is the debut of paperboard cartons containing nine and 12 bricks in the 8.45-ounce size. ■

Additional information about containers and closures used by the beverage industry is published in PACKAGING's Encyclopedia.

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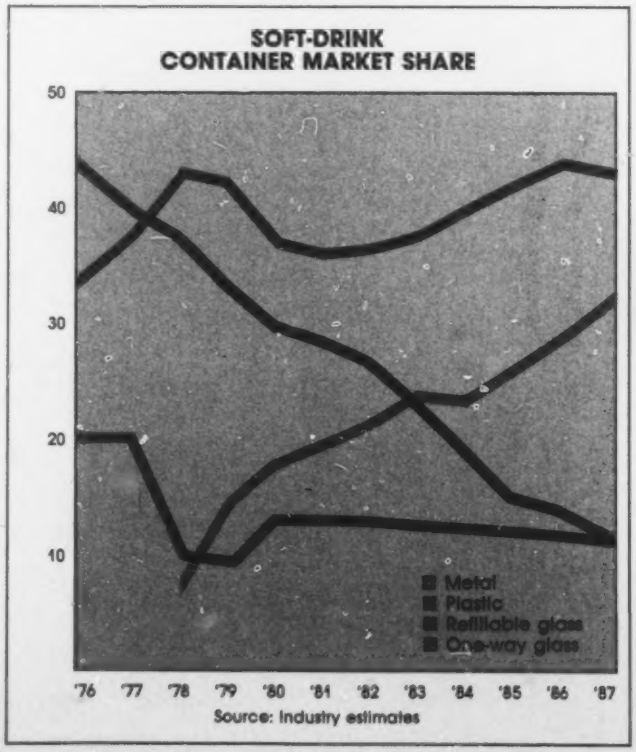
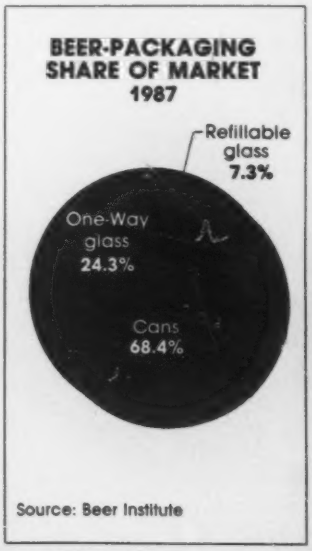
Above Average	442
Average	443
Below Average	444

GREG ERICKSON
Senior Editor

"The beverage industry is experiencing tremendous pressure to keep up with consumers' changing tastes while not cutting its profit margins. It's a matter of working creatively within some very strict guidelines."





Materials for beverage containers preferred by consumers, facing page, vary by beverage. Soft-drink trends since 1976 show refillable glass steadily losing share as plastic zooms upward.